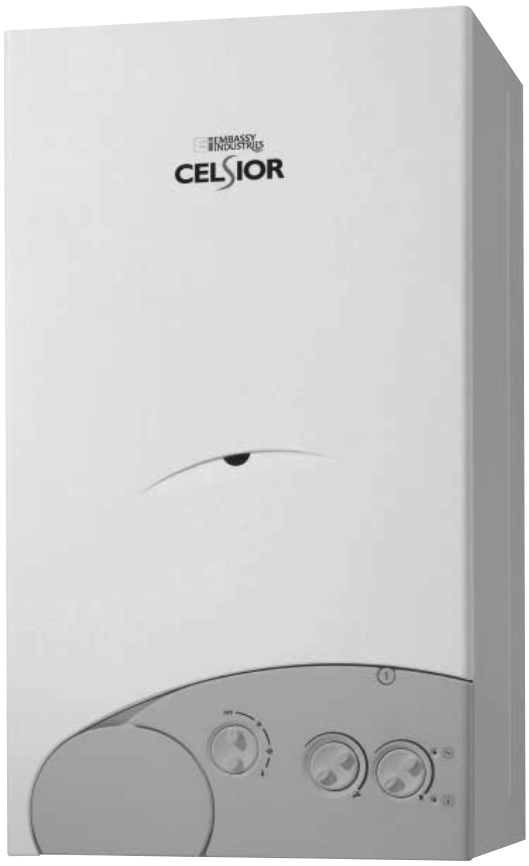
CELSIOR

“Combi” Gas-Fired Boiler/Water Heater

Model 35 BF

Installation and Operating Instructions



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EMBASSY INDUSTRIES Inc.

315 Oser Avenue • Hauppauge, NY 11788
Tel: (631) 694-1800 • Fax: (631) 694-1832
www.embassyind.com

A MESTEK COMPANY

Fonderie Sime S.p.A.
Via Garbo, 27 – 37045 LEGNAGO (VR)

declares that:

a) The materials used in the interior of the boiler are suitable for the use of drinking water.

b) No dangerous toxic substances were used to manufacture the boiler and its components, which could enter the drinking water.

c) There is no contact zone between drinking water and the water used for the heating system.

déclare que:

a) Les matériels utilisés à l'intérieur de la chaudière sont idoines pour l'utilisation de l'eau potable.

b) Dans la fabrication de la chaudière et de ses composants aucune substance toxique dangereuse n'a été utilisée qui pourrait s'infiltrer dans l'eau potable.

c) Il n'existe aucune zone de contact entre l'eau potable et l'eau du circuit de chauffage.

Date:
02/03/2009

CLAUDIO MEZZALIRA
Fonderie SIME Spa
Technical Manager

Installation Instruction and User and Care Guide

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WARNING: If the information in this manual is not followed exactly, a fire of explosion may result causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable liquids or gases in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliances.
  - Do not touch any electrical switches, do not use any phone in your building.
  - Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions.
  - If you cannot reach the gas supplier, call the fire department.
- Installations and service must be performed by a qualified installer, service agency or the gas supplier.

Warning: Do not use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any gas control which has been under water.

Warning: Should overheating occur, or the gas supply fail to shut off, shut off the gas supply external to the appliance. Do not switch off the electrical supply to the pump.

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1 DESCRIPTION OF THE BOILER

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1.1 INTRODUCTION

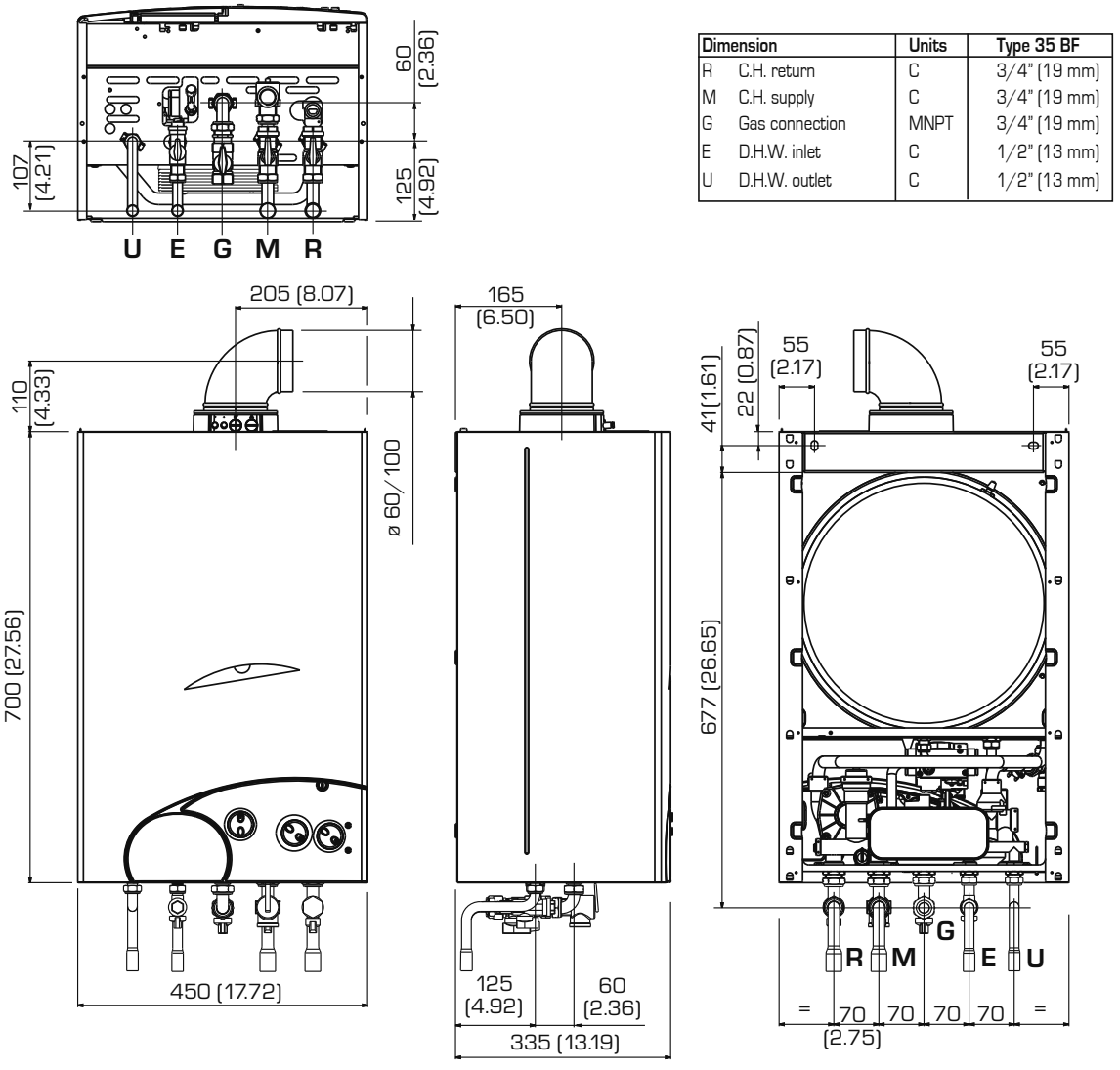
Celsior boilers are gas-fired thermal appliances for central heating and domestic hot water production, designed and manufactured to satisfy the needs of multiple dwelling and modern boiler room requirements. They comply with ANSI Z21. 13 and CSA 4.9 GAS FIRED LOW PRESSURE STEAM AND HOT WATER BOILERS.

These appliances can be fired by both natural gas and Liquid Propane Gas.
This booklet provides the instructions for the **Celsior** with eletronic ignition, modulation, and direct sealed forced-draught.
The instructions given in this manual are provided to ensure proper installation and perfect operation of the appliance.

IMPORTANT
When carrying out commissioning of the boiler, you are highly recommended to perform the following checks:

1. Make sure that there are no liquids or inflammable materials in the immediate vicinity of the boiler.
2. Make sure that the electrical connections have been made correctly and that the earth wire is connected to a good earthing system.
3. Open the gas cock and check the soundness of the connections, including that of the burner.
4. Make sure that the boiler is set for operation for the type of gas supplied.
5. Check that the flue pipe ensuring the outlet of products of the combustion is unobstructed and has been properly installed.
6. Make sure that any shuotff valves are open.
7. Make sure that the system is charged with water and is thoroughly vented.
8. Check that the circulating pump is not locked.
9. Purge the system, bleeding off the air present in the gas pipe according to procedures outlined in the local codes or those having jurisdiction.
10. The installer must provide the user with instruction in operation of the boiler and safety devices and hand over the instruction booklet to the user.

1.2 DIMENSIONS: mm (in)



Dimension		Units	Type 35 BF
R	C.H. return	C	3/4" (19 mm)
M	C.H. supply	C	3/4" (19 mm)
G	Gas connection	MNPT	3/4" (19 mm)
E	D.H.W. inlet	C	1/2" (13 mm)
U	D.H.W. outlet	C	1/2" (13 mm)

Figure 1

Model 35 BF	Units	Natural gas	Propane
Maximum input	kW	39.2	35.2
	But/h	133,800	120,000
Minimum input	kW	23.2	21.3
	But/h	79,200	72,700
Maximum output	kW	32.7	31.1
	But/h	111,700	106,300
Minimum output	kW	19.6	17.8
	But/h	66,900	60,700
Water content	l	8.0	8.0
	USgal	2.1	2.1
Electric Power consumption	W	165	165
Maximum C.H. pressure	bar	3	3
	psi	43.5	43.5
Maximum C.H. temperature	°C	85	85
	F	185	185
Expasion vessel Water content	l	8	8
	USgal	2.1	2.1
Expasion vessel Pre-charged	bar	1	1
	psi	14.5	14.5
C.H. setting range	°C	40-80	40-80
	F	104-176	104-176
D.H.Wsetting range	°C	30-60	30-60
	F	86-140	86-140
Continuous D.H.W. flow rate Δt 30°C	l/min	15.5	14.7
	USgal/min	4.09	3.89
Minimum D.H.W. flow rate	l/min	2.4	2.4
	USgal/min	0.63	0.63
Minimum D.H.W. pressure	bar	0.50	0.50
	psi	7.3	7.3
Maximum D.H.W. pressure	bar	8.6	8.6
	psi	125	125
Vent Category		III	III
Weight	kg	40	40
	lb	88.2	88.2
Quantity of burners	n°	15	15
Orifice	ø mm	1.30	0.85
Maximum manifold gas pressure	mbar	13.7	24.9
	"W.C.	5.5	10.0
Minimum manifold gas pressure	mbar	5.0	8.7
	"W.C.	2.0	3.5
Minimum gas supply pressure	mbar	16.2	30
	"W.C.	6.5	12.0

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CLEARANCES FROM COMBUSTIBLE MATERIALS:

Bottom: 0 mm (0 in.)
Sides: 0 mm (0 in.)
Rear: 0 mm (0 in.)
Front: 0 mm (0 in.)
Top: 0 mm (0 in.)
Flue (superate vent): 150 mm (6 in.)
Flue (co-axial vent): 50 mm (2 in.)

CLEARANCES FROM SERVICE AND PROPER OPERATION:

Bottom: 150 mm (6 in.)
Sides: 150 mm (6 in.)
Rear: 150 mm (6 in.)
Front: 600 mm (24 in.)
Top: 150 mm (6 in.)

MINIMUM CLEARANCES FROM ELECTRIC METERS, GAS METERS, REGULATORS AND RELIEF EQUIPMENT :

US: 4 feet (1.22 m)
CND: 6 feet (1.83 m)

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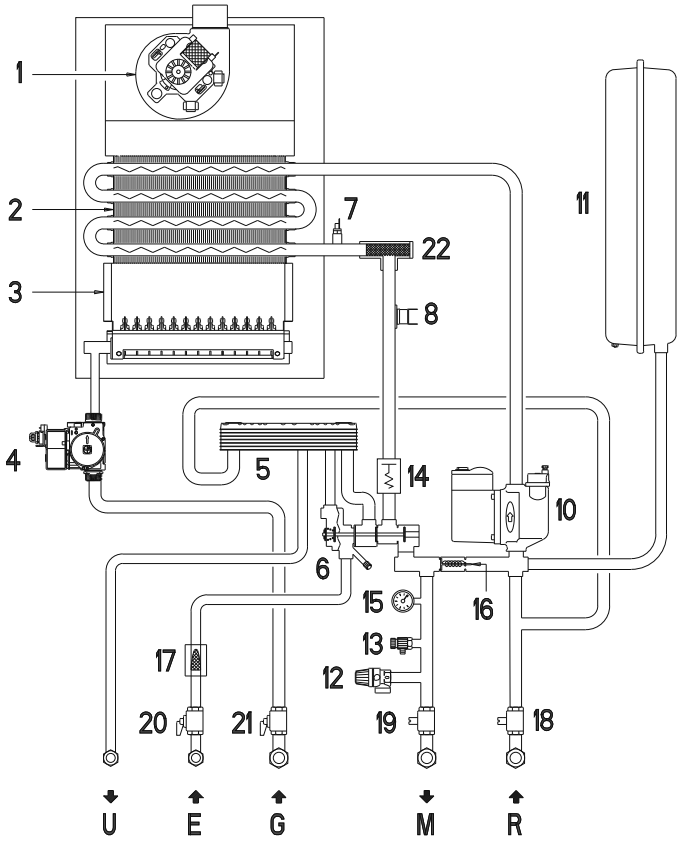
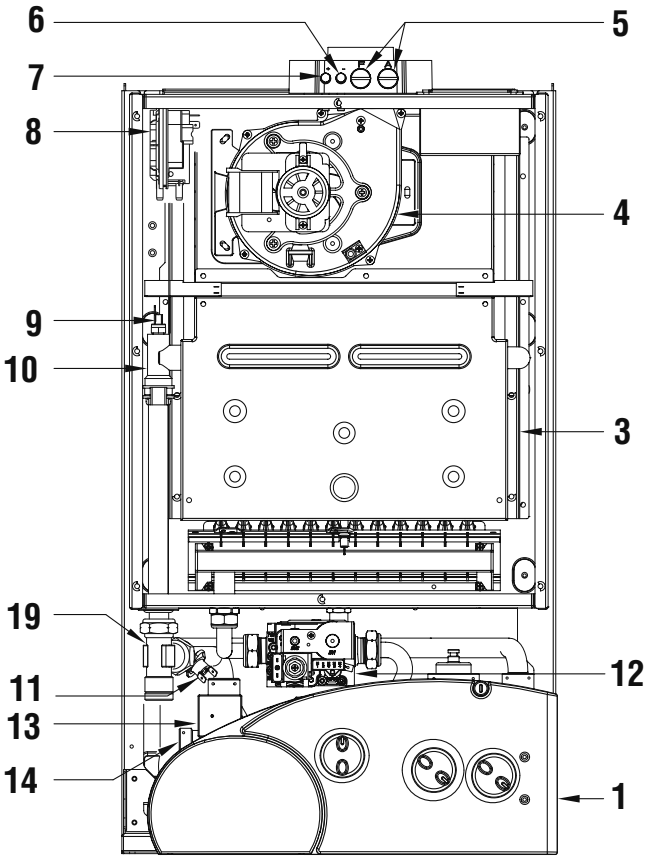


KEY
1 Fan
2 Main exchanger
3 Combustion chamber
4 Gas valve
5 D.H.W. plate exchanger
6 Divertor valve
7 C.H. sensor (SM)
8 100°C safety stat
10 Pump with automatic air vent
11 Expansion vessel
12 Safety valve
13 Boiler discharge
14 Water flow switch
15 Tridicator
16 Automatic by-pass
17 D.H.W. filter
18 C.H. return cock
19 C.H. flow cock
20 D.H.W. cock
21 Gas cock
22 Aqua Guard Filter System

Figure 2



KEY
1 Control panel
3 Combustion chamber
4 Fan
5 Combustion analysis intakes
6 Negative pressure intake
7 Positive pressure intake
8 Smoke pressure switch
9 C.H. sensor (SM)
10 Main exchanger
11 100°C safety stat
12 Gas valve
13 Flow water switch
14 Divertor valve
15 Aqua Guard Filter System

Figure 3

2 INSTALLATION

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The installation must conform to the requirements of the Authority having jurisdiction or, in the absence of such requirement, to the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and, or CAN/CGAB149 Installation Code. Where required by the Authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1. All boilers must be installed with a proper pressure relief valve. Pressure relief valves must be installed to confirm to ANSI/ASME Boiler and Pressure Vessel Code, Section IV, or CSA B51, as applicable. If the boiler is installed above the radiation level, or as required by the Authority having jurisdiction, the installer must provide a low water cut-off device at a time of installation. The boiler must be installed in a fixed location and only by a qualified installer, service agency or the gas supplier and is familiar with the requirement that are contained in this manual. Furthermore, the installation must be in accordance with current standars and regulations. The boiler must not be installed on carpeting. The boiler when used in connection with a refrigeration system, must be installed so the chilled medium is piped in parallel with the boiler with appropriate valves to prevent the chilled medium from entering the boiler. The boiler piping system of a hot water boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle. Service instructions and recommended frequency guidelines periodic examination of venting systems every six months. Venting systems, the vent-air intake system, screens in the vent terminal should be checked and cleaned every six months. Low water cutoff should be checked and cleaned every six months. Remove small cover retaining screw and remove the cover. When the pump is running and water is flowing around the boiler , the actuator lifts off the micro switch. Check that the operation of the actuator ; Ensure that it is free and that it lifts and returns. If necessary lubricate the pivot point of the actuator. Flue gas passageways should be checked and cleaned every six months. The burner should be checked and cleaned every six months. Inspect the burner and if necessary clean using a soft brush and a vacuum cleaner, taking care not to damage the front insulation. Check the ignition /ionisation electrode, check the ignition spark gap (3.5 mm +/- 0.5 mm) (0.138 in. +/- 0.02 in.). Before reassembly inspect all seals and replace as required. Furthermore, the installation must be in accordance with current standards and regulations.

2.1 VENTILATION OF BOILER ROOM

When using air from the boiler room, an adequate air supply shall by provided for combustion of this boiler. An insufficient supply can result in poor combustion and possible sooting of the burner, combustion chamber or flue passageway. The boilers installed using inside air supply must provide provisions for Combustion Air and Ventilation Air in accordance with section 53, Air for Combustion and Ventilation, of the National Flue Gas Code, ANSI Z 223,1/NFPA 54, or section 7,2, 7.3, or 7.4, of CAN/CGA B 149, Installation Codes, or local codes having jurisdiction. Where an exhaust fan or any other air consuming appliance is installed in the same space as the boiler, sufficient air openings must be available to provide fresh air when all appliance are operating simultaneously. It is essential that in rooms where the boiler are installed at least as much air can arrive as required by normal combustion of the gas consumed by the various appliances. Consequently, it is necessary to make openings in the walls for the air inlet into the rooms. These openings must meet the following requirements:

1. **Have a total free section of a least 2225 mm^2 every kW (1 in^2 for every 1000 Btu/hr) of heat input, with a minimum of 100 cm^2 (15.5 in^2);**
2. **They must by located not more than 18 in or less than 6 in above the floor level, not prone to obstruction and protected by a grid which does not reduce the effective section required for the passage of air;**
3. **Where requide by jursdiction or when required for additional opening must be provided at the highest elevation practical.**

With a hermetically sealed combustion chamber and air supply circuit from outdoors, may be installed in any room in the home. Keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

2.2 INSTALLATION PLATE

The installation plate code 6246958 is supplied with the boiler.
The optional installation plate code 8075416 is supplied with an instruction sheet for the fixing.

2.2.1 Isolating valves kit

To fit the isolating valves, supplied with the boiler, use figure 4 for assembly.

2.2.2 System connection unions

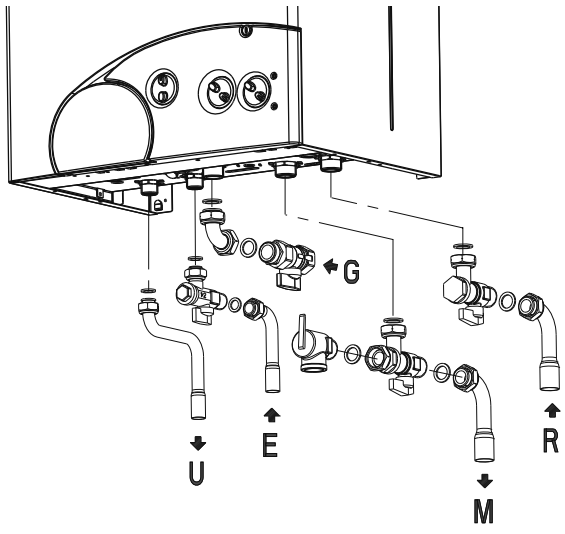
The follow is available to facilitate water and gas connection of the boiler with the heating system: for assembly of the unions to see fig. 1.

2.3 CONNECTING UP SYSTEM

To protect the heat system from damaging corrosion, flakes or deposits, before installation it is extremely important to clean the system using suitable products such as, descaler or slug removing solution. For long-term protection against corrosion and deposits, the use of inhibitors is required for new installations and after cleaning the system. It is important to check the concentration of the inhibitor after each system modification and during maintenance following the manufacturer's instructions (specific tests are available at your dealer). The safety valve drain must be connected to a collection funnel to collect any discharge during interventions. If the heating system is on a higher floor than the boiler, install the on/off taps supplied in kit on the heating system delivery/return pipes.
WARNING: Failure to clean the heat system or add an adequate inhibitor invalidates the device's warranty.

2.3.1 Gas Requirements

Read the date plate to be sure the water heater is made for the type of gas being used. An adhesive data plate is stuck inside the front panel, it contains all the technical data identifying the boiler and the type of gas for which the boiler is arranged. If the information does not agree with the type of gas available, do not install or operate the water heater. Call your dealer. The gas piping must be installed according to all local and state codes, or in absence of local and state codes, with the latest "Natural gas and propane installation code", CAN/CSA-B 149.1 or "National Flue Gas Code", ANSI Z223.1 (NFPA 54). Consult the "Natural gas and propane installation code" or "National Flue Gas Code" for the recommended gas



R C.H. return
M C.H. supply
G Gas connection
E D.H.W. inlet
U D.H.W. outlet

Figure 4

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pipe size of other materials. The sections of the piping making up the system must be such as to guarantee a supply of gas sufficient to cover the maximum demand, limiting pressure loss between the gas meter and any apparatus being used to not greater than:

1. 1.2 mbar (0.5"W.C.) for supply pressures under 17 mbar (7"W.C.);

2. 2.5 mbar (1.0"W.C.) for supply pressures from 17 mbar (7"W.C.) to 35 mbar (14"W.C.).

Gas connestions must be made in accordance with current standards and regulations. When dimensioning gas pipes from the meter to the boiler, both capacity volume (consumption) in m^3/hr (ft^3/hr) and gas density must be taken into account. The boiler and the boilers gas connection must be leak tested before it is put in to operation. The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during pressure testing of the system at pressures in excess of 1/2 psi (3.5 kPa). The boiler must be isolated from the gas supply piping system by closing its individual manual shut off valve during any pressure testing of the supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa). The boiler shall be installed such that the gas ignition system components are protected from water (dripping, spraying, rain etc.) during boiler operation or service (circulators or control replacement etc.). The boiler and its gas connection must be leak tested before placing the the boiler is put into operation. Use a chloride-free soap and water solution (bubbles forming indicate a leak) or other approved method. After placing the boiler in operation, the ignition system safety shutoff device must be tested.

To testing the system:

- Close the gas valve (gas cock)
- feed to boiler
- initiate a call for heat (see user instructions)
- verify red led "Ignition lock-out" light is on, after ignition boiler.
- reset boiler by rotating the function knob to chimney sweep and stay at least one second, and after back to "winter" or "summer" position.
- finally open the gas cock.

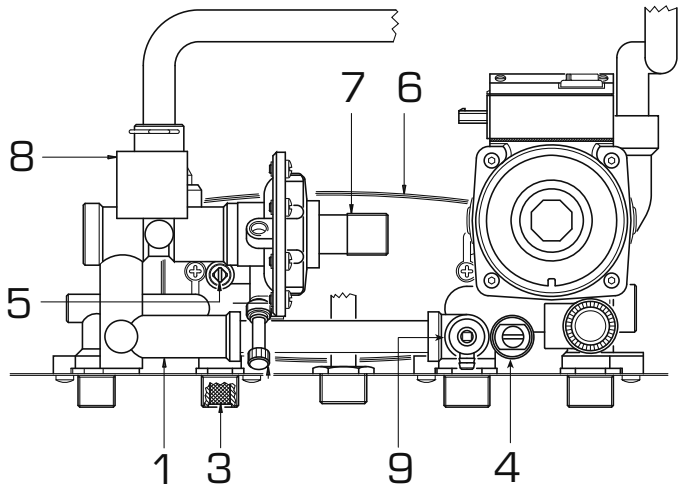
2.3.2 Filter on the gas pipe

The gas valve is supplied by the factory with an inlet filter, which, however, is not adequate to entrap all the impurities in the gas or in gas main pipes.

To prevent malfunctioning of the valve, or in certain cases even to cut out the safety device with which the valve is equipped, install an adequate filter on the gas pipe. In any case, a sediment trap must be installed upstream of the gas controls.

2.4 SYSTEM FILLING

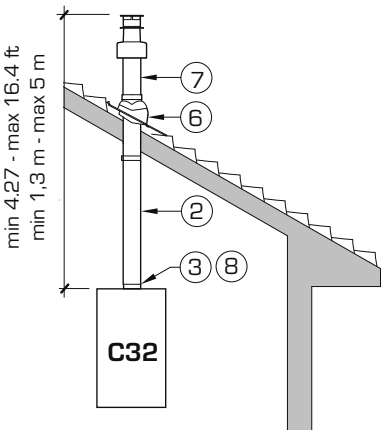
Filling of the boiler and the system is done by installing a pressure reducing valve. The charge

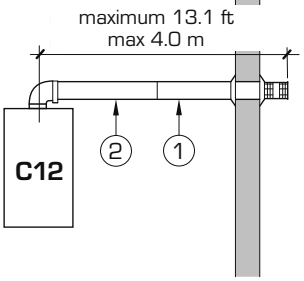


KEY

1 D.H.W. inlet/outlet manifold
3 D.H.W. filter
4 By-pass
5 Water rate adjuster
6 D.H.W. exchanger
7 Microswitches
8 Water flow switch
9 Boiler discharge

Figure 5





IMPORTANT:

- **Each additional 90° curve (code 8095801) installed reduces the available length by 0.90 metres (3 ft).**
- **Each additional 45° curve installed reduces the available length by 0.45 metres (1.5 ft).**
- **It is advisable to assemble the condensation collector (8) on vertical segments exceeding 2.5 metres (8.2 ft) in length and to limit maximum length to 4 metres (13.1 ft).**

KEY

1 Coaxial flue kit L. 810 mm (32 inch) code 8084811
2 a Extension L. 1000 mm (39.4 inch) code 8096103
2 b Extension L. 500 mm (19.7 inch) code 8096102
3 Vertical extension L. 200 mm (7.9 inch) code 8086908
6 Articulated tile code 8091300
7 Roof outlet terminal L. 1284 mm (50.6 inch) code 8091200
8 Vertical condensation collector L. 200 mm (7.9 inch) cód. 8092803

Figure 6

pressure, with the system cold, must be between **1** and **1.2 bar** (14.5 and 17.4 psi). During system filling you are recommended to keep the main switch turned OFF. Filling must be done slowly so as to allow any air bubbles to be bled off through the air valves. Should the pressure have risen well above the limit expected, discharge the over pressure by opening the pressure-relief valve. Bleed pump by loosen plug at back of motor. Once air is removed re-tighten plug. It may be necessary to free the pump motor before filling the system. This is done by removing the pump plug and turning the pump shaft loose. Do not forget to re-tighten pump plug before filling system.
See typical piping in the figure below.

2.4.1 **Emptying the system** (fig. 5)

Use the drain tap to empty the system (9).

Turn off the boiler before doing this.

2.5 FLUES/CHIMNEYS

The flue or chimney used to release the products of combustion into the atmosphere must comply with current standards and regulations. Horizontal vent lengths must be supported every I meter (39 in) or less to prevent sagging.

2.5.1 Passing flue pipes through an existing chimney

When renovating or passing flue pipes through an existing chimney, use only flues which are declared suitable for the purpose by the manufacturer, following the instructions for installation and use provided by the manufacturer.

2.6 INSTALLATION COAXIAL PIPE (fig. 6)

The air inlet-smoke outlet assembly ø 60/100 is supplied in a kit code 8084811 complete with mounting instructions.
With the curve supplied in the kit the maximum horizontal length of the flue must not exceed 4 m (13 ft).
The diagrams in fig. 6 illustrate a number of examples of different coaxial outlets.

2.6.1 **Coaxial flue diaphragm** (fig. 6/a)

The boiler is supplied as standard with a ø 86 diaphragm. With outlet type C12, install diaphragm ø 84 mm (3.3 inch) only if the coaxial flue is less than 1 metres (3.3 ft) long.
For C32 discharge options, it is necessary to order the optional diaphragm separately and use it in accordance with the instructions provided in figure 6/a.

2.7 INSTALLATION SEPARATE PIPES

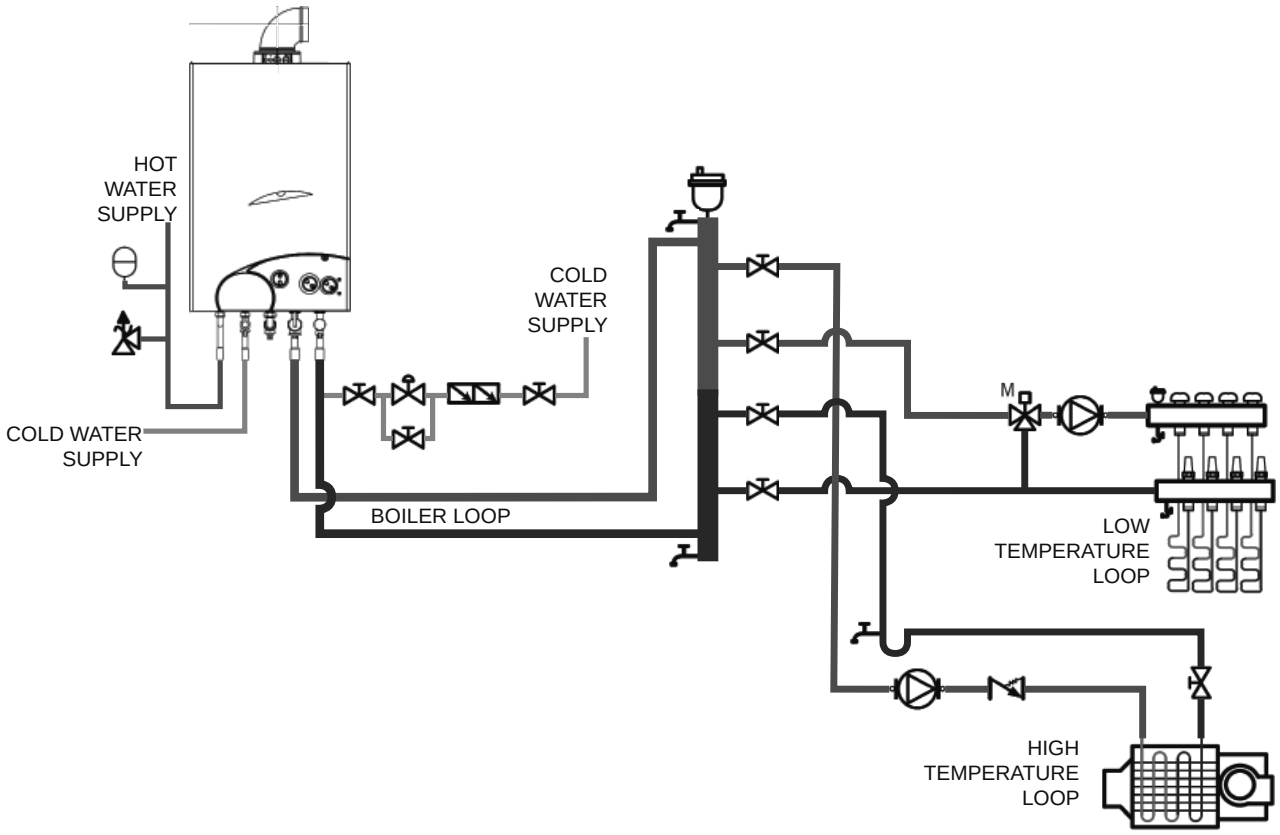
The smoke pipe must be certified ø 3" category III venting. When installing the pipes, follow closely the requirements of the current standards and regulations, as well as the following practical pointers:

1. With direct intake from outside, when the pipe is longer than 1 m (3.3 ft), you are recommended to insulate the piping so as to prevent formation of dew on the outside of the piping during particularly hard periods of the year.

2. With the outlet pipe outside the building or in cold indoor environments, insulation is necessary to prevent burner failure during trial for ignition. In such cases, provide for a condensate-collector system on the piping.

3. If a segment of the flue passes through a flammable wall, this segment must be insulated with a glass wool pipe insulator 30 mm (1 in) thick, with a density of 50 kg/m^3 (3lb/ft^3) or follow vent manufacturers instructions for clearances to combustibles.

TYPICAL PIPING



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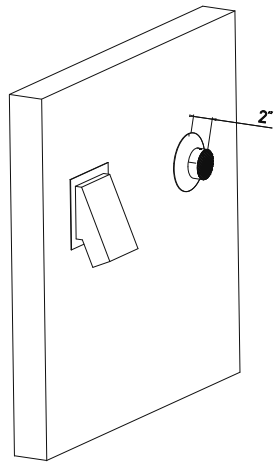
4. The distance between the intake air and the smoke pipe must be within 300 mm (12 in) - (see fig. below).

5. The head loss of the smoke pipe cannot exceed by more than 4.8 mm (0.19 in) of the intake head loss.

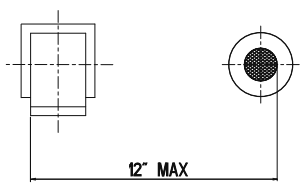
6. Outlet terminal must be flush with the wall and the inlet terminal must protrude at least 50 mm (2 in) from the outstide wall (see fig. below).

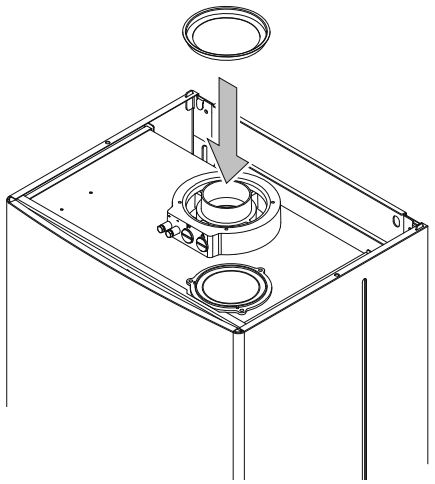
The maximum overall length of the intake and exhaust ducts depends on the head losses of the single fittings installed and must not be greater than 12 mm H_2O (0.472 "W.C.).
(ATTENTION! The total length of linear exhaust sections should not exceed 8 m (26 ft) as compared to the total length of linear suction sections).
For head losses in the fittings, refer to **Table 1** and example fig. 7.

Slanted view



Frontal view





With outlet type C12, install diaphragm ø 84 mm/3.3 inch only if the coaxial flue is less than 1 metres (3.3 feet) long.

With outlet type C32, use the following diaphragms, depending on flue length and without any additional curves:

Installations with vertical extension L. 200 mm/7.9 inch code 8086908			Installations with vertical condensation collector code 8092803	
Diaphragm ø 86/3.4" (cod. 6028623)	**Diaphragm ø 87.5/3.44" (cod. 6028624)**	**Without diaphragm**	**Diaphragm ø 87.5/3.44" (cod. 6028624)**	**None diaphragm**
L min = 1,3 m 4.27 ft	**L min = 2,5 m 8.2 ft**	**L min = 4 m 13.1 ft**		**L min = 2,5 m 8.2 ft**
L max = 2,5 m 8.2 ft	**L max = 4 m 13.1 ft**	**L max = 5 m 16.4 ft**	**L max = 2,5 m 8.2 ft**	**L max = 4 m 13.1 ft**

Figure 6/a

TABLE 1

Vent Accessories ø 3"	Load loss in mm H_2O ("W.C.H_2O)		
	Intake	Outlet	Roof outlet/Intakes
45° curve MF	0.6 (0.024)	0.3 (0.012)	—
90° curve MF	0.65 (0.026)	0.5 (0.020)	—
Extension L. 1000 mm/39.4 inch (horizontal)	0.3 (0.012)	0.13 (0.005)	—
Extension L. 1000 mm/39.4 inch (vertical)	0.3 (0.012)	0.06 (0.002)	—
Terminal 1 (Termination box : 2SVSRTF)	—	0.8 (0.0315)	—
Terminal 2 (Termination hood : 2SVSHTX)	—	0.6 (0.0236)	—
Intake terminal	0.2 (0.008)	—	—
Manifold	0.3 (0.012)	—	—
Roof outlet terminal L.1390	—	—	0.6 (0.024)
Condensation collection T	—	1.1 (0.043)	—

Example of allowable installation calculation in that the sum of the head losses of the single fittings is less than 7.0 mm H_2O (0.276 "W.C.H_2O):

	Intake		Outlet	
23ft horizontal pipe ø 3" mm x 0.30	2,1		---	
23ft horizontal pipe ø 3" x 0.13	---		0,91	
n° 2 90° elbows ø 3" x 0.65	1,3		---	
n° 2 elbows 90° ø 3" x 0.50	---		1,0	
n° 1 terminal ø 3"	0,2		2,0	
Total head loss	3,6	+	3,91	= **7,51 mmH_2O (0.296 "W.C.H_2O)**

With this total head loss, remove the segments from n. 1 to n. 9 from diaphragm in the intake pipe.

Figure 7

2.7.1 Separate flue kit (fig. 8)

The separate flue kit code 8089909 is supplied with an intake diaphragm which must be used as shown in fig. 8/a, depending on the maximum load loss permitted in both flues. To use the air intake in this type of outlet you must perform the following operations (fig. 9):

1 Remove the base of the air intake, using a tool to cut it off (a);
2 Overturn the air intake (b) and replace the seal (5) with the seal supplied in the kit code 8089909;
3 Insert the intake diaphragm supplied in the kit code 8089909, pushing it in until it is in contact with the bottom bead.

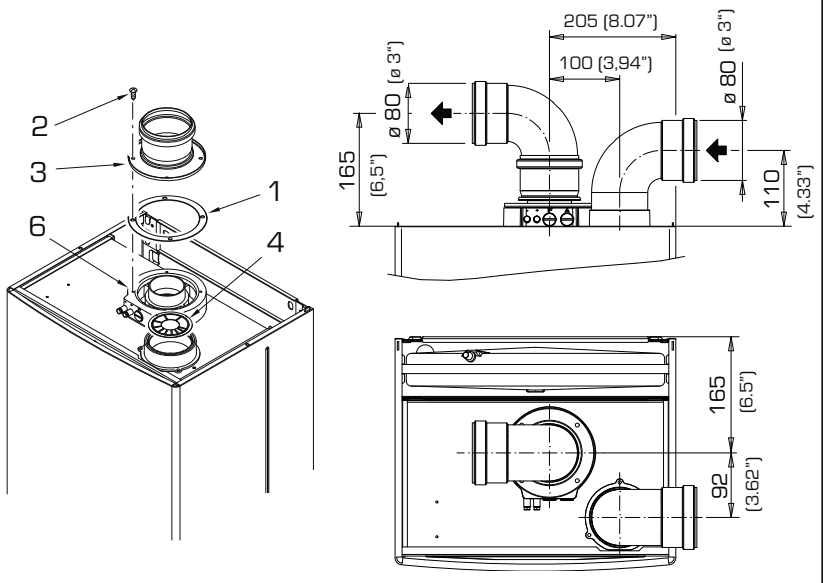
You can now insert the extension or curve in its housing to complete the intake. You need not use any seal or sealant, as gasket provided is sufficient.

2.7.2 Outlet systems

The diagrams in fig. 9/a illustrate a number of examples of different types of separate outlets.

2.8 POSITIONING OF OUTLET TERMINALS (fig. 11)

The outlet terminal must be flush with the wall and the inlet terminal must protrude 50 mm (2 in) from the outstide wall at least.



KEY
1 (ø 125/95 mm - ø 4.92/3.74 inch) sponge seal
2 Fixing screw
3 Flue outlet flange
4 Inlet air diaphragm
6 Manifold with intakes

Figure 8

N° segments to remove	Load loss (mm H_2O)	("W.C.H_2O)
n° 1 and 2	0 - 1.0	0 - 0.039
from n° 1 to 3	1.0 - 2.0	0.039 - 0.079
from n° 1 to 4	2.0 - 3.0	0.079 - 0.12
from n° 1 to 5	3.0 - 4.0	0.12 - 0.16
from n° 1 to 6	4.0 - 5.0	0.16 - 0.20
from n° 1 to 7	5.0 - 6.0	0.20 - 0.24
from n° 1 to 8	6.0 - 7.0	0.24 - 0.28
from n° 1 to 9	7.0 - 8.0	0.28 - 0.31
from n° 1 to 10	8.0 - 10.0	0.31 - 0.39
without diaphram	10.0 - 12.0	0.39 - 0.47

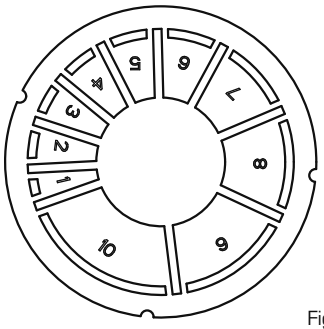
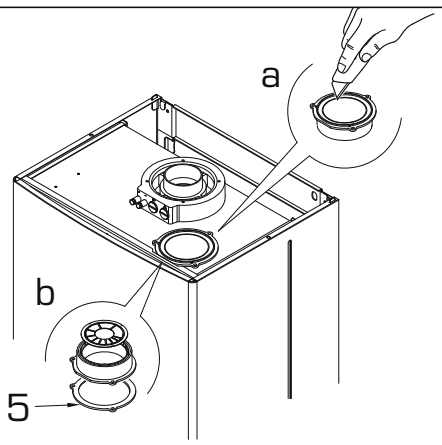
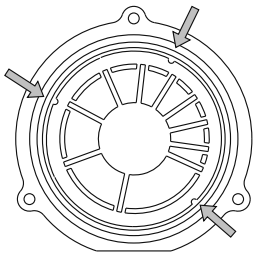


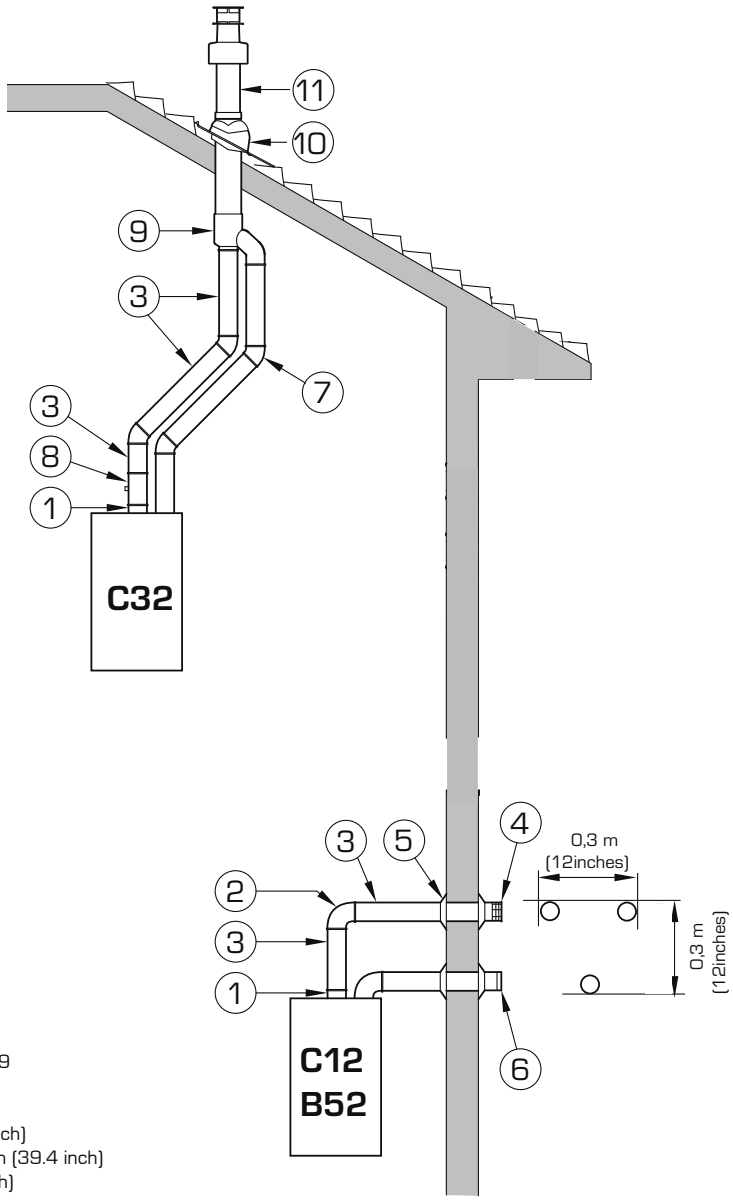
Figure 8/a





IMPORTANT: The three housings on the diaphragm permit assembly of the air intake in one position only.

Figure 9



KEY

1	Separate flue kit code 8089909
2a	90° elbow MF
2b	Isolated 90° elbows MF
3a	Extension L. 1000 mm (39.4 inch)
3b	Insulated extension L. 1000 mm (39.4 inch)
3c	Extension L. 500 mm (19.7 inch)
4	Outlet terminal
5	Int.-est. ring kit
6	Intake terminal
7	45° elbow MF
8	Condensation outlet L. 135 mm (5.31 inch)
9	Doubler fitting
10	Tile with articulated joint
11	Roof outlet terminal L. 1390 mm (54.7 inch)
12	Tee condensation outlet

IMPORTANT: In type C52 the outlet and inlet flues must not come out on opposite walls.

Figure 9/a

Outlet terminals for forced draft systems may be located on the outer walls of the buildings. **Table 2** shows approximate, non-binding minimum distances to be met for a building of the type shown in fig. 5. Please refer to local codes for minimum clearances.

2.9 ELECTRICAL CONNECTION

The boiler must be electrically bonded to ground in accordance with the requirements of the Authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/ NFPA 70 and or the Canadian Electrical

To install the tubes in such way protect the building materials from degradation by fluegas.

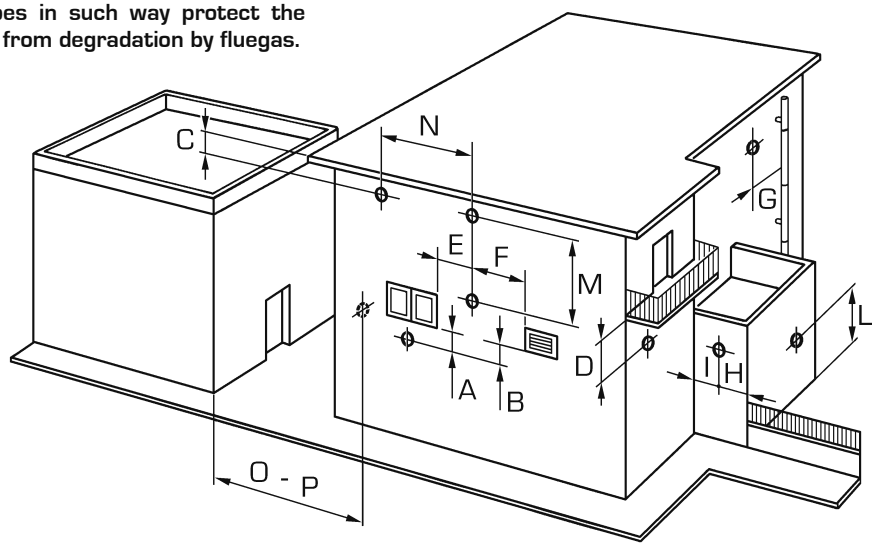


TABLE 2

MINIMUM DISTANCE	mm	feet
A - below openable window or door	900	3
B - below ventilation opening (non mechanical)	900	3
C - below eaves	300	1
D - below balcony	300	1
E - from adjacent window or door	900	3
F - from adjacent ventilation opening (non mechanical)	900	3
G - from horizontal or vertical soil or drain pipes (2)	300	1
H - from corner of building	300	1
I - from recess in building	300	1
L - above a paved sidwalk or a paved driveway that is located on private property	2100	7
M- between two terminals set vertically	600	2
N - between two terminals set horizontally	600	2
O - from a surface facing without openings or terminals	2000	6.56
P - as above but with openings and terminals	3000	9.84

1. The vent shall not terminate;
   a) directly above a sidewalk or paved driveway that is located between two single - family dwellings and severs both dwellings;
   b) less that 2.1m (7 ft) above a paved sidewalk or a paved driveway that is located on public property;
   c) within 1.8 m (6 ft) of a mechanical air-supply inlet to any building;
   d) above a meter and regulator assembly within 1.8 m (6 ft) horizontally of the vertical centerline of the regulator vent outlet to a maximum vertical distance of 4.5 m (15 ft);
   e) within 1.8 m (6 ft) of any gas service regulator vent outlet;
   f) less than 300 mm (1ft) above grade level plus expected snow level;
   g) within 900 mm (3 ft) of a window or door that can be opened in any building, of any non-mechanical air supply inlet to any building, or of any combustion air inlet of any other appliance;
   h) Underneath a veranda, porch, or deck unless;
   i) the veranda, porch, or deck is fully open on a minimum of two sides beneath the floor;
   ii) the distance between the top of the vent termination and the underside of the veranda, porch, or deck is greater that 300 mm (1ft).

2. When setting terminals, where materials that may be subject to the action of the combustion products are present in the vicinity, e.g., eaves, gutters and downspouts painted or made of plastic material, projecting timberwork, etc., distances of not less than 1.5 m (5 ft) must be adopted, unless adequate shielding is provided to guard these materials.

Fig. 11

ENG

2.8.2 Instructions special stainless steel venting system for use with Category III appliances

PARTS LIST

COMPONENT	3" SYSTEM CAT. #	COMPONENT	3" SYSTEM CAT. #
10 FOOT PIPE	SVEPWC0310	ADJUST. FLASHING	SVSADJ03
8 FOOT PIPE	SVEPWC0308	REDUCER 4" TO 3"	SVSERWC0403
5 FOOT PIPE	SVEPWC0305	FLAT FLASHING	SVSSCS03
4 FOOT PIPE	SVEPWC0304	LOCKING BAND	SVSLBX03
3 FOOT PIPE	SVEPWC0303	FIRESTOP SUPPORT	SVSFSS03
2 FOOT PIPE	SVEPWC0302	FIRESTOP SPACER	SVSFSX03
1 FOOT PIPE	SVEPWC0301	TERMINATION HOOD	SVSHTX03
6 INCH PIPE	SVEPWC03.5	TERMINATION BOX	SVSRTX03
90 ° ELBOW	SVEEWC0390	RAIN CAP	SVSRCX03
45 ° ELBOW	SVEEWC0345	TOP SUPPORT	SVSLSX03
HORIZ. DRAIN TEE	SVEDWC03	STORM COLLAR	SVSSCX03
VERTICAL DRAIN TEE	SVEVWC03	Z-VENT SEALANT	GE106X
WALL THIMBLE	SVSWTX03		
DRAIN TUBE KIT	SVEDTK		

Z-FLEX recommends that an experienced professional who works with venting systems on a regular basis perform the installation. These instructions are intended as a guide to assist a professional installer.
When the **Z-VENT** system is installed, the following should be observed:

1. A venting system that exits the structure through a sidewall or the like, shall terminate not less than 12 inches (254 mm) above the ground (see figure 6/a, page 22).

2. The termination of a system shall be located above the snow line in geographical areas where snow accumulates. The termination area should be kept clear of snow and ice at all times.

3. The vent shall not terminate less than 7 ft. (2.13 m) above a paved sidewalk or driveway.

4. The termination shall be 6 ft. (1.8 m) or more from the combustion air intake of any appliance.

5. The system shall terminate more than 3 ft. (0.91 m) from any other building opening, gas utility meter, service regulator or the like.

6. Exterior mounted venting systems should be enclosed below the roof line with a chase to limit condensation and protect against mechanical failure.

NOTES:

A. The Z-FLEX SPECIAL STAINLESS VENT SYSTEM is for use only with appliances having a positive vent pressure of 8" of water column or less.

B. Except for installation in one and two family dwellings, a venting system that extends through any zone above that on which the connected appliance is located shall be provided with an enclosure having a fire resistance rating equal to or greater than that of the floor or roof assemblies through which it passes.

C. Do not place any type of insulation in any required air spaces surrounding the venting system.

D. A termination must be used on all installations to assure proper operation and to prevent debris from entering the venting system.

E. The Z-Vent system must be free to expand and contract.
Pipe must be properly supported. Vertical runs must use firestops as lateral support at each ceiling level and at least one support collar at the base of the vertical run.
For vertical runs exceeding 16' (4.88 m), a support collar is required at 16' (4.88 m) intervals.
Horizontal runs require a loose fitting metal strap or similar support at each joint.

F. Examine all components for possible shipping damage prior to installation.

G. Proper joint assembly is essential for a safe installation. Follow these instructions exactly as written. Check severeness of joints upon completion of assembly.

H. Check for unrestricted vent movement through walls, ceilings and roof penetrtions.

I. Different manufacturers have different joint systems and adhesives. Do Not Mix Pipe, Fittings or Joining methods from different manufacturers.

Joint procedure
(see figure 6 below)

The female end of each Z-Vent III component incorporates a silicone sealing gasket.
Examine all components to insure that gasket

integrity has remained during shipping. Gaskets must be in the proper position or flue gases could leak resulting in carbon monoxide poisoning.

1. Align pipes and push them together as far as they will go (to indent or at least 1.75 inches).

2. Tighten gear clamp to a minimum torque of 40 in/lbs. and a maximum of 50 in/lbs.

NOTE: Some flue collars may require the use of high temperature silicone sealant to make a positive pressure gas tight seal.

Side wall venting installation

ENG

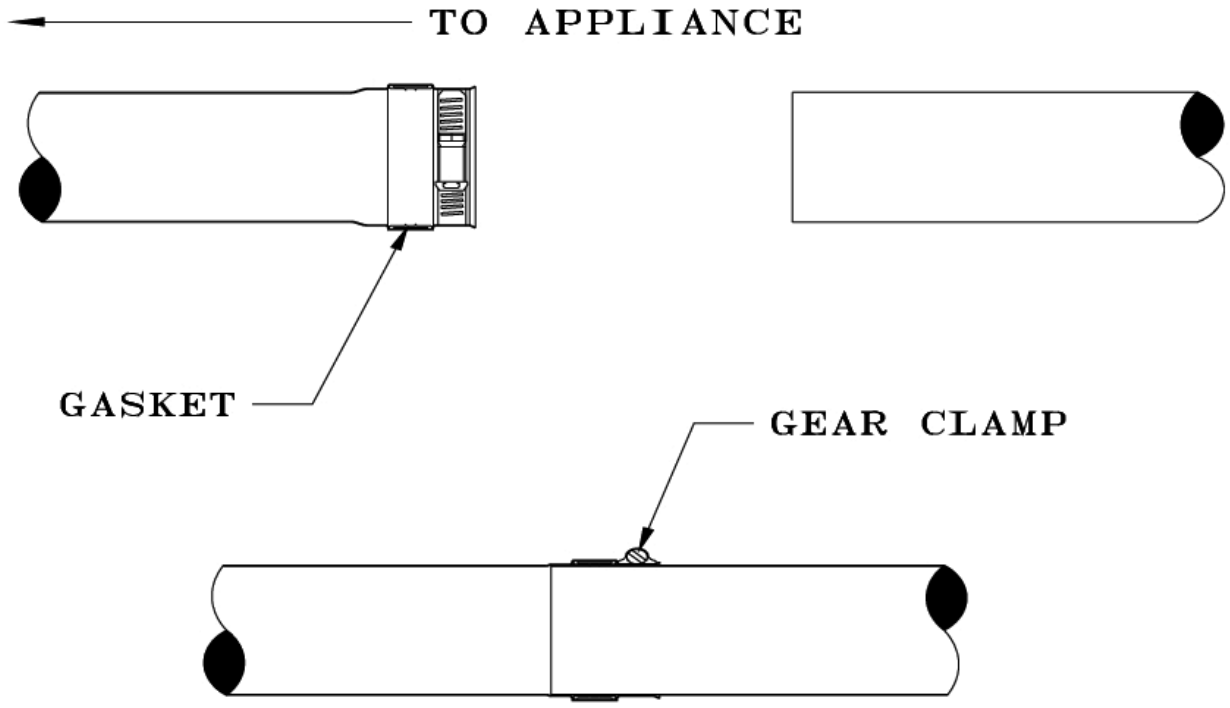


FIGURE 6

CLEARANCE TO COMBUSTIBLES

SYSTEM OPERATING TEMPERATURE	CLEARANCE ENCLOSED		CLEARANCE UNENCLOSED	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
300°F (149°C)	8" (200 mm)	4"(100 mm)	1"(25 mm)	1" (25 mm)

ENG

(see figure 6/a below)

1. Penetrating a combustible wall requires the use of a wall thimble.
   The pipe may be mortared in directly without using a wall thimble, if the wall is non-combustible. Install wall thimble into wall, observing the aforementioned rules and/or local building codes.
   Select the point of wall penetration where the minimum 1/4 " per foot of slope (6.4 mm-0.25 in. per 305 mm-12 in.) can be maintained.
   A framed opening is required to insert the thimble halves.
   The thimble is adjustable for different wall thicknesses.
   Caulk around outside edge of plates as necessary and fasten to wall using suitable screws or nails.
   The vent pipe must be sealed at wall thimble as per code regarding continuous vapor barrier.
2. The system can now be assembled through the thimble (attach the termination first - note "UP" arrow) and then back to the appliance as per illustration using JOINT PROCEDURE as described on page 21.
   A gear clamp (or locking band) must be installed around the pipe on the inside of wall to trap pipe in position so that the system cannot be moved in or out of wall. This applies to both combustible and non-combustible walls.
3. The system must be supported along its horizontal length at all elbow locations and joints (every forty-eight inches or less) using straps around pipes maintaining clearance to combustibles as per table on page 21.
   Any horizontally installed portion of a venting system shall have a slope (upwards for Category II, III, or IV appliances or downwards for Category III or IV appliances) not less than 1/4" (6.4 mm) every 12 inches (305 mm) to prevent collection of condensate at any location in the assembly. Fasteners must not penetrate the components of the system either when joining pipes and fittings or using support straps.
   The lengths of pipe may be cut on non-expanded end using aviation snips or a hacksaw (24 tpi).
   The cut end must be filed or sanded smooth before joining. When installing the condensate tube be sure to form a trap by means of a 3" (76.2 mm) loop filled with water.
   This tube must be 3/8" (10 mm) ID high temperature silicone for at least the first 6 inches (152 mm) and attached with a gear clamp or hose clamp. The effluent must be disposed of according to local regulations.

NOTE: Z-FLEX recommends using a neutralizer kit when using a condensate trap. A condensate pump may be required.

Vertical venting

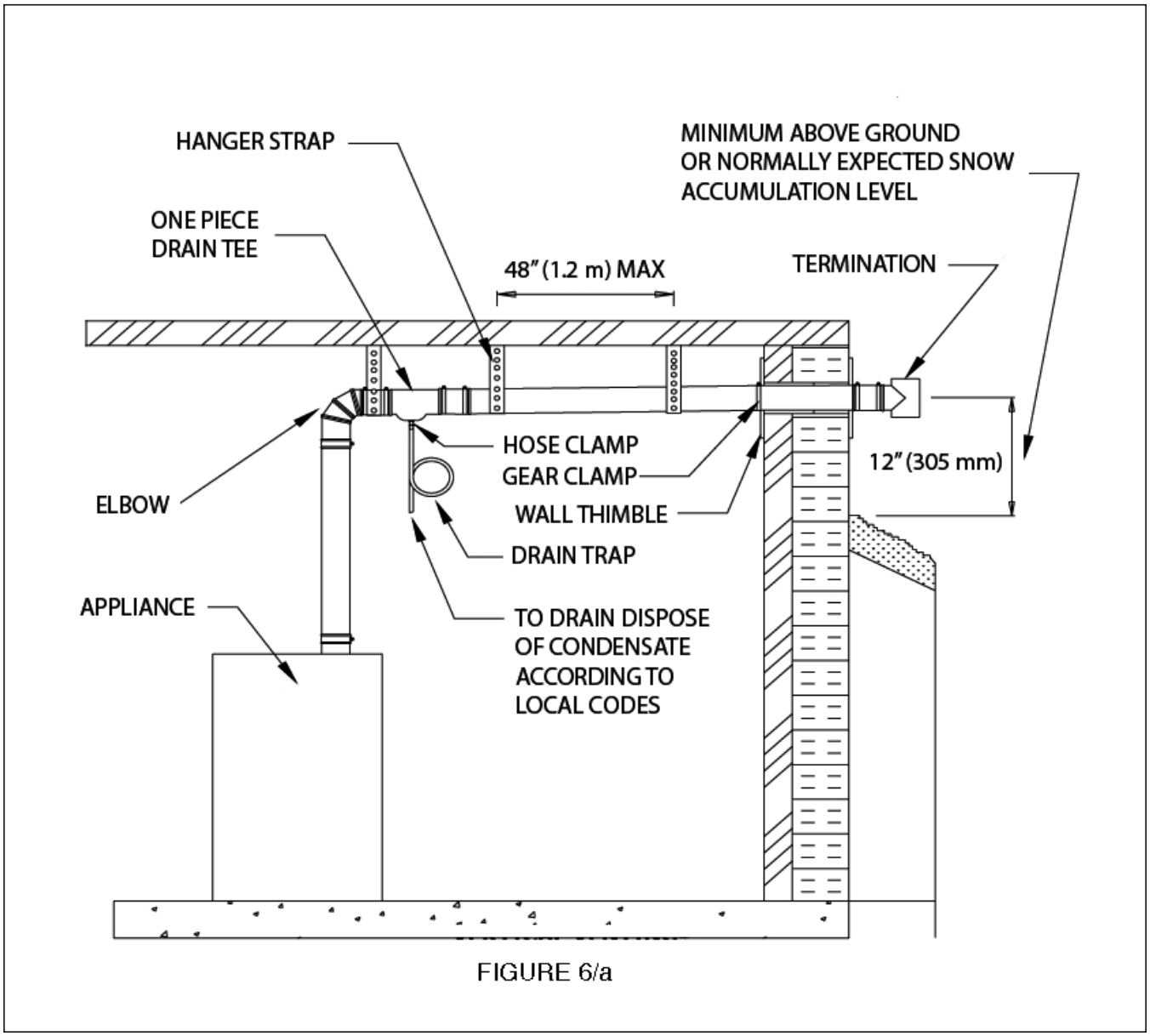


FIGURE 6/a

(see figure 6/b - 6/d)

NOTE: The vent termination must be at least 3 ft. (1 m) to a maximum of 6ft. above the roof line and 2 ft. (.61 m) higher than any part of a structure within 10 ft. (3.1 m). The total vertical distance of the vent system from appliance flue collar to the rain cap termination and the maximum length of offsets shall not exceed that specified in the appliance manufacturer's installation instructions. No continuous vertical run shall be longer than sixty feet (18.3 m). All horizontal sections must observe the rules for **HORIZONTAL VENTING**. The clearance to combustibles inside a chase shall be no less than 4" (100 mm).

1. Prior to beginning the installation loosely assemble all parts required to make sure all parts are present.

2. Locate position for venting system and proceed to cut holes for firestop support and firestop spacers. All vertical installations require the use of a support. Frame the opening of the floor using lumber, which is dimensionally consistent with the structural members. Insert the support from beneath the framed opening and secure with nails or screws as required.

3. Refer to **JOINT PROCEDURE** (figure 6) before assembling system.

4. Install system joining pipe as required up through roof (illustration page 25). Tighten gear clamp on firestop support to hold vent system. NOTE: A firestop must be provided when a vent passes through a combustible floor or ceiling. The opening must be framed for the support since the support also serves as a firestop.

5. The roof flashing can now be installed. Where the vent passes through the roof a flashing must be used to maintain the required clearances and to protect from the elements. The framed opening must be large enough to provide the necessary clearances to combustibles, taking into account the slope of the roof. The flashing can be used on slopes from flat to 6/12 pitch. Install the flashing while holding the pipe centered in the opening. Fasten the flashing to the roof under the roofing material upslope from the pipe and above the roofing material below the pipe. Seal as required using high temperature silicone.

6. Install Top Support around pipe and against flashing collar. (figure 6/b, 6/d, 6/e, 6/c)

7. Attach rain cap using. **JOINT PROCEDURE** (figure 6)

8. The vertical section is connected by an elbow joined to the horizontal run and then through a drain tee (see page 4 for details) to the appliance. Elbows are joined to pipe using the **JOINT PROCEDURE** (figure 6).

NOTE: If there is no solid anchor point in the system below the roof (ie Firestop Support etc.) then a Z-Vent Guy Band must be used below the roof as follows. (see figure 6/c)

a. Attach the Guy Band at any point above an elbow or tee in the vertical section within 20 feet of the roof.
b. Fasten stainless steel or galvanized cable with a minimum capacity of 500 lbs. to each of the four anchor holes.
c. Anchor the cables to a rigid building member using an appropriate fastening method.

Above the roof
(see figure 6/c)

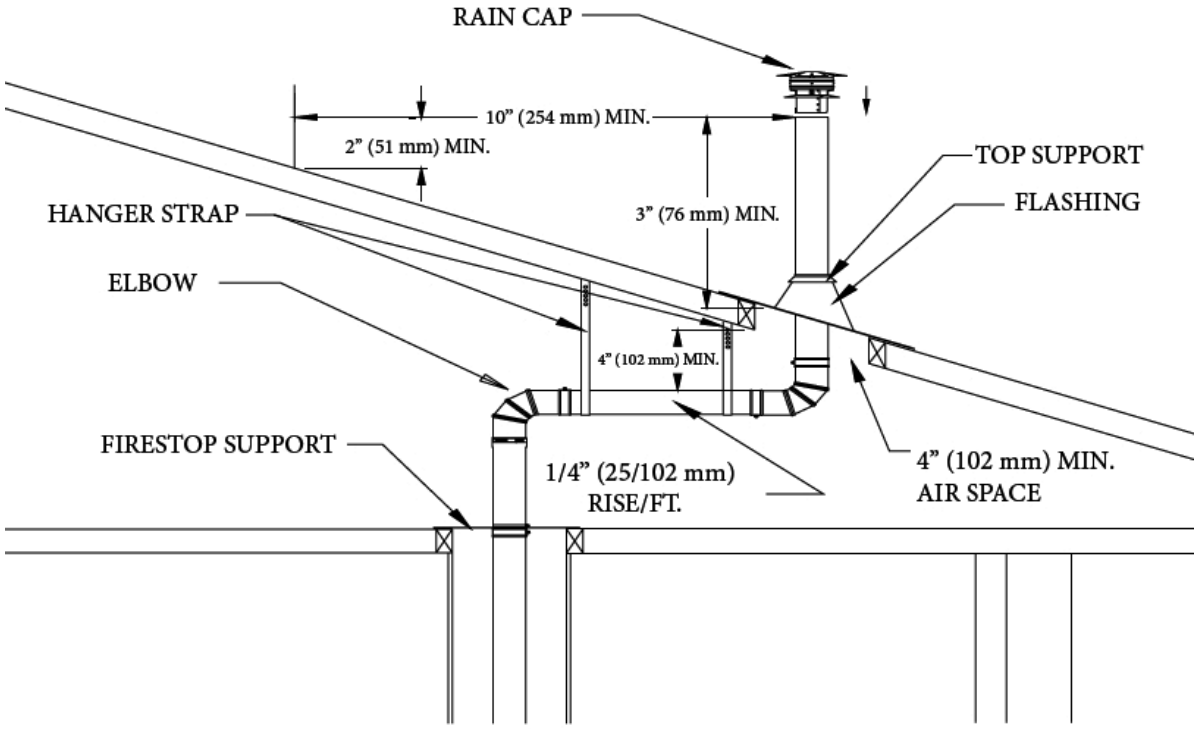


FIGURE 6/b

ENG

NOTE: When Z-Vent must be extended above the roof line more than six (6) feet the Guy Band must be used to support the system.

1. Install the Guy Band below the Rain Cap using the 10-24 screw and nut provided.
2. Attach stainless steel or galvanized cable with a minimum rated capacity of 500 lbs (227 kgf) to each of the four anchor holes.
3. Anchor the cables to a rigid building member using an appropriate fastening method.

Existing masonry chimney
(See figure 6/e)

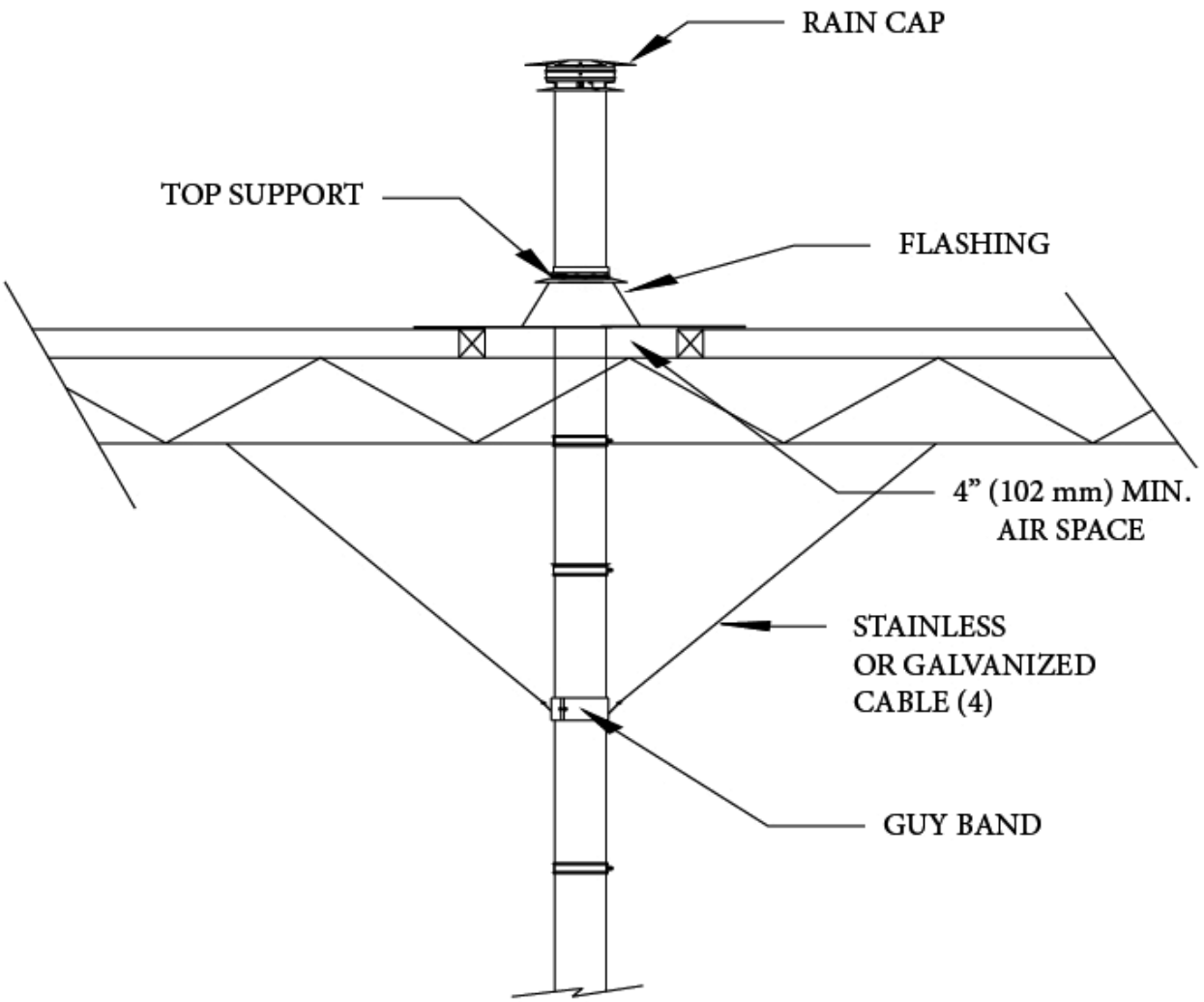


FIGURE 6/c

NOTE: A masonry chimney flue may be used to route **Z-VENT** if no other appliance vents directly into the same flue without a liner. Prior to beginning the installation, be sure that the existing chimney meets all national and local building codes. The chimney must be cleaned, removing all soot, debris and creosote before installing **Z-VENT**.

1. Using the **JOINT PROCEDURE**, (figure 6) join pipe lengths as they are lowered down the chimney until bottom end lines up with opening in chimney. (A rope may be used to facilitate lowering of pipe).
2. Install flashing over last pipe length and attach top support to pipe. Leave 6" (150 mm) of pipe protruding from flashing so that rain cap may be installed and to allow for any adjustment to line up base tee properly.
3. Fasten flashing to chimney top using caulking and/or screws. If the top clay tile is still in place, the corners of the flashing must be notched and flashing plate formed down around clay tile.
4. The rain cap may now be installed using the **JOINT PROCEDURE** (figure 6).
5. Where required a drain tee should be installed to a pipe as per **JOINT PROCEDURE** (figure 6).
6. The remainder of the horizontal installation to the appliance can be done the same as for side wall venting on page 22 observing rules for **HORIZONTAL VENTING**.
7. Final adjustment may be made to the top support if necessary.

VERTICAL INSTALLATION

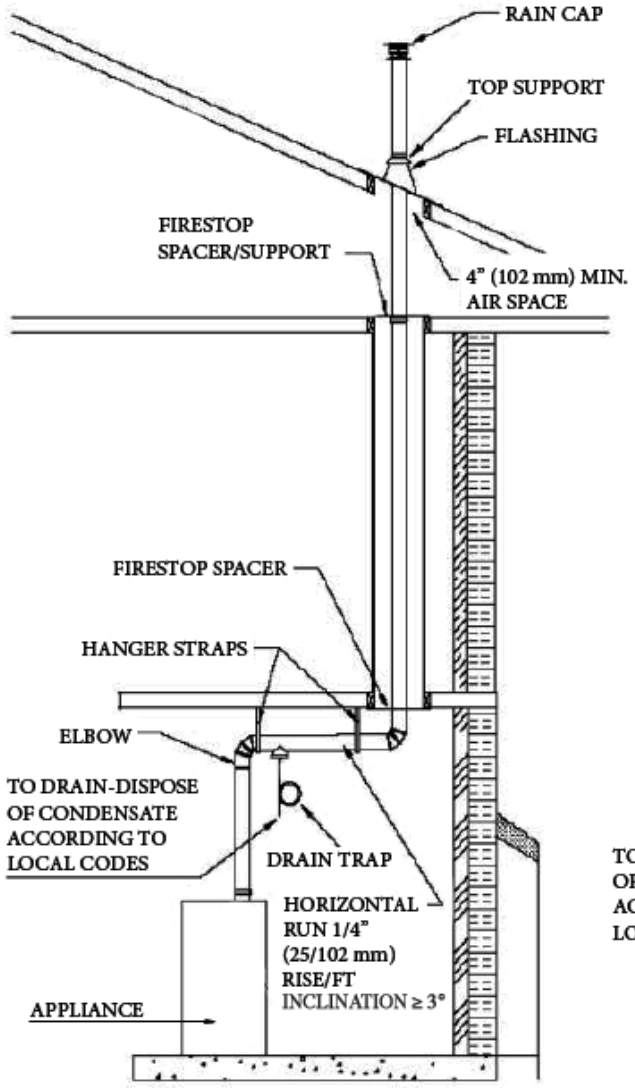


FIGURE 6/d

VERTICAL INSTALLATION - MASONARY

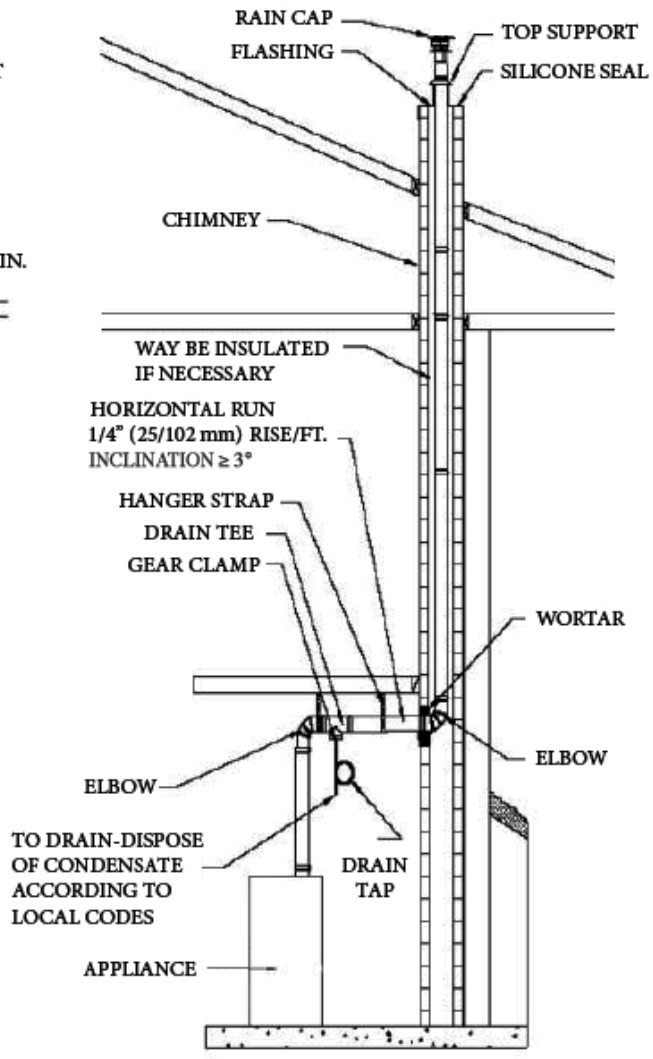


FIGURE 6/e

ENG

Code Part I, CSA C22.1, Electrical Code. If you must replace the electric power cable supplied with the boiler, order it exclusively from Sime.
The power supply must be single-phase 120 V-60 Hz througth a main switch protected by a fuse with a distance of a least 3 mm (0.118 inch) between contacts.
NOTE: The boiler must be connected with an efficient grounding system. SIME shall not be held liable for injury or damage resulting from failure to ground the boiler.

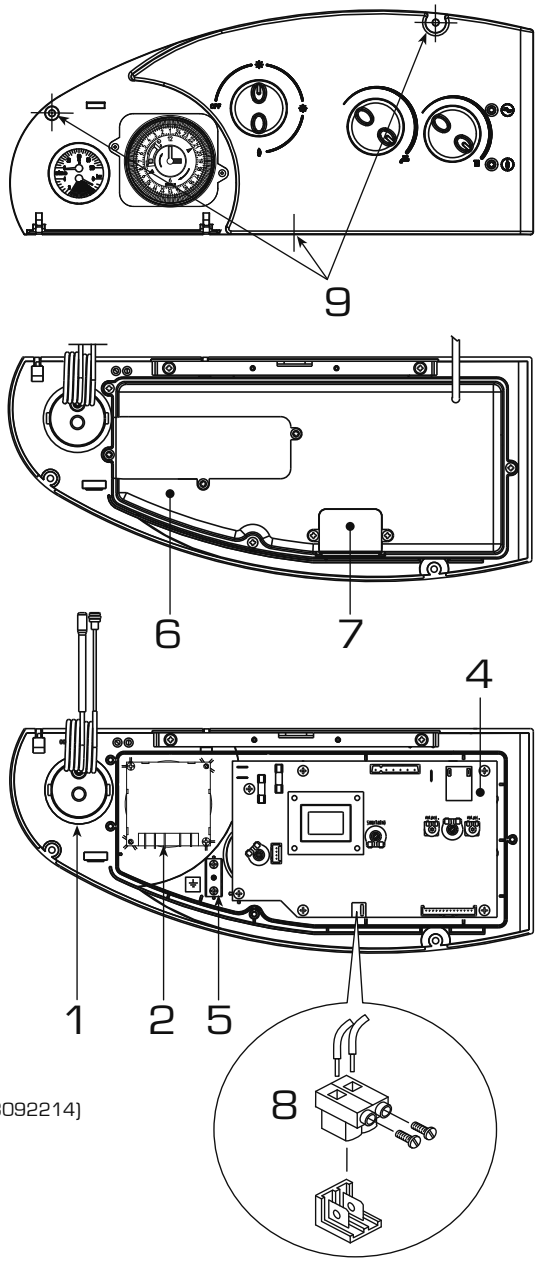
2.9.1 Electrical panel (fig. 12)

Before performing any kind of operation, disconnect the unit by unpluging the power cord.
Placing the boiler selector in position "OFF" does not disconnect the electric board from the power supply.
Caution: Label all wires prior to disconnecting wires when servicing control. Wiring errors can cause improper and dangerous operation.
After connecting all wires, verify proper operation after servicing.
Remove the three screws (9) locking the control panel in place and pull the panel forward until it can be tilted downward.
To access the components of the electrical panel, unscrew the four screws holding the protective guard in place (6).

2.9.2 Room stat connection (fig. 12)

To gain access to connector **"TA"**, remove the control panel cover (7) and connect the room stat to the terminals 15-16 after having removed the jumper.
The thermostat or timer-thermostat, recommended for better room temperature control, must be dry contact.

IMPORTANT: Before performing any kind of operation, disconnect the unit from the power supply using the bipolar switch of the plant. Placing the boiler selector in position "OFF" does not disconnect the electric board from the power supply.

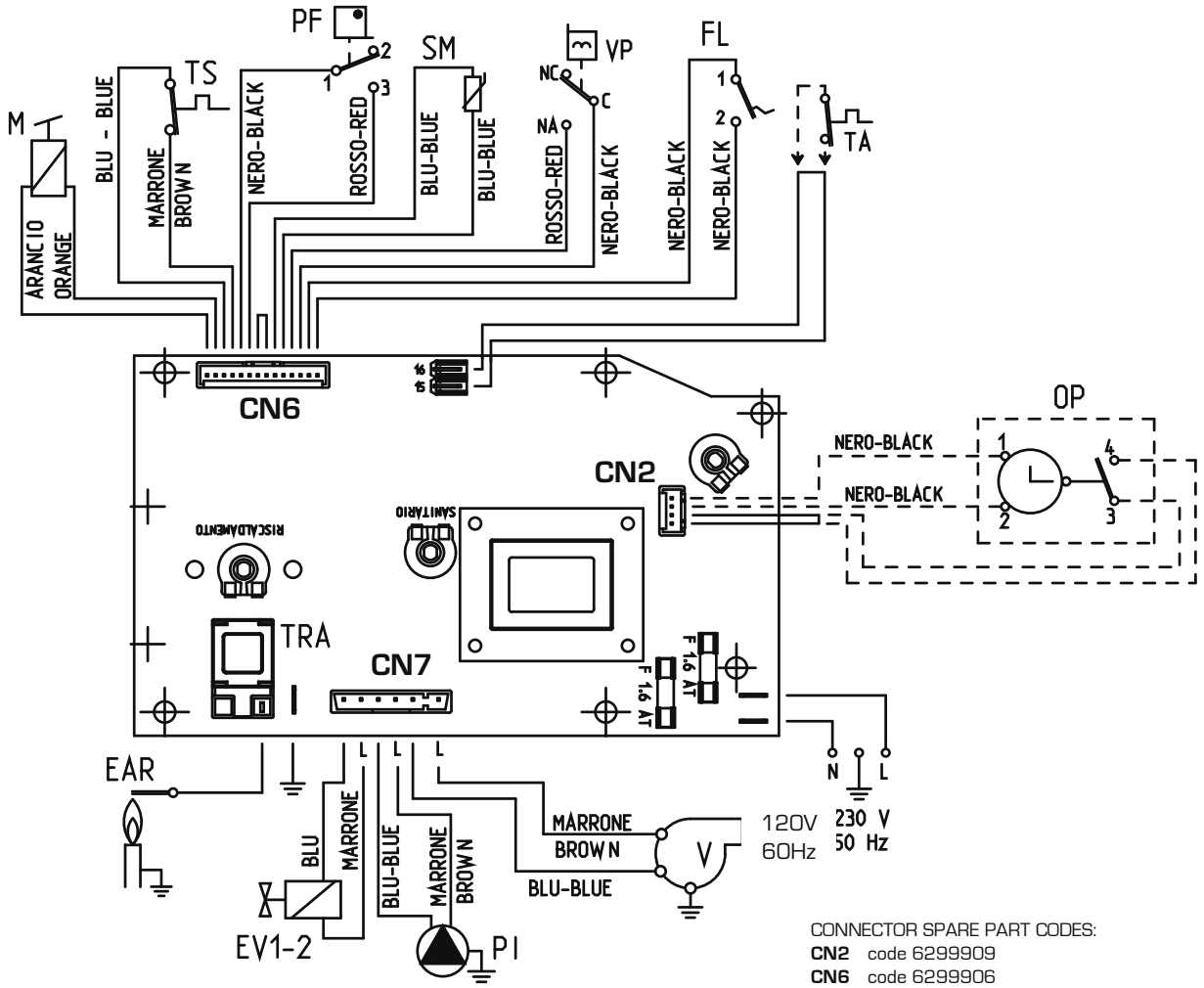


ATTENTION: After having removed the three screws, slide the panel outward to tilt it downward.

KEY
1 Tridicator
2 Time programmer seet (optional cod. 8092214)
4 Main PCB
5 Earth ground
6 Control panel protection
7 Cover (TA)
8 Connector (TA)
9 Fixing screw

Figure 12

2.9.3 Wiring diagram



CONNECTOR SPARE PART CODES:
CN2 code 6299909
CN6 code 6299906
CN7 code 6299907

KEY

F	Fuse (1.6 AT)
PI	C.H. pump
EV1-2	Gas valve coil
V	Fan
PF	Smoke pressure switch
VP	Divertor valve
M	Modulator
SM	C.H. sensor
SS	D.H.W. probe
TA	Room stat
EAR	Ignition/detection electrode
TRA	Ignition transformer
TS	100°C (212°F) safety stat
PA	Water pressure switch
FL	Flowmeter
TF	Smokes stat
OP	Time programmer

Nota: The room stat or the programmable thermostat must be connected to terminals 15-16 of the "TA" connector after having removed the bridge.

Figure. 13

3 CHARACTERISTICS

ENG

3.1 ELECTRONIC BOARD

The electronic boards are manufactured in compliance with the ANSI and Canadian directives.
They are supplied with 120V and, through a built-in transformer, send a voltage of 24V to the following components: modulator, D.H.W./C.H. sensors, room stat, water flowmeter/water pressure switch, pressure switch valve, flue gas thermostat/flue gas pressure switch, safey thermostat and time programmer.
An automatic and continuous modulation system enables the boiler to adjust the heat output to the various system requirements or the User's needs.
The electronic components are guaranteed against a temperature range of 0° to +60°C (32°-140° F)

3.1.1 Fault finding

The indicator leds signalling irregular and/or incorrect operation of the equipment are indicated in fig. 14.

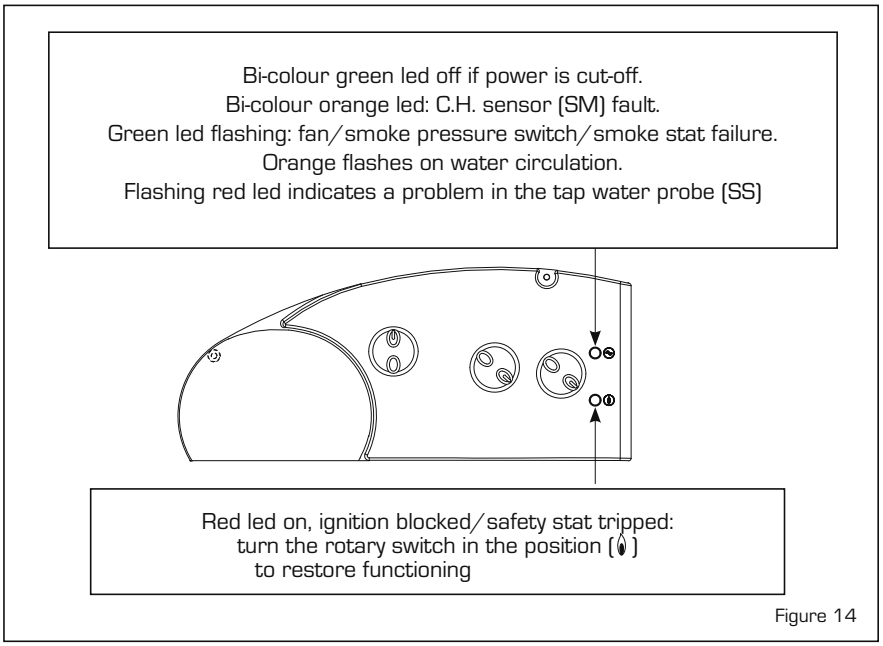

Bi-colour green led off if power is cut-off.
Bi-colour orange led: C.H. sensor (SM) fault.
Green led flashing: fan/smoke pressure switch/smoke stat failure.
Orange flashes on water circulation.
Flashing red led indicates a problem in the tap water probe (SS)
Red led on, ignition blocked/safety stat tripped:
turn the rotary switch in the position ( )
to restore functioning

Figure 14

3.1.2 Devices

The electronic board is equipped with the following devices (fig. 15):

- **Connector "METANO-GPL"** (4)
  With the connector disconnected, the boiler is ready to function with METHANE; with the connector connected with GPL.

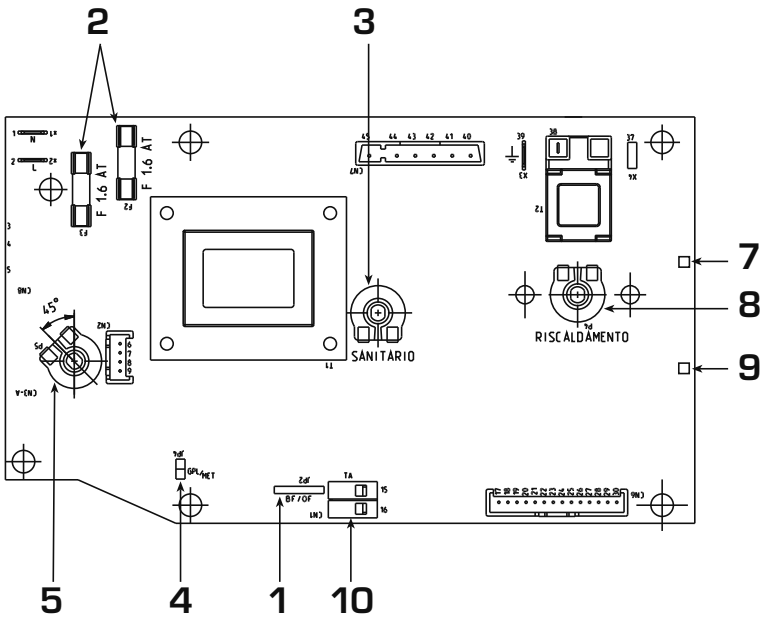
ATTENTION: It is essential that the operations described above be carried out by authorized technical staff.

3.2 TEMPERATURE SENSOR

Antifreeze system made up of the NTC heating sensor that activates when the water temperature reaches 6°C (43 F).
The sensor acts as a limit stat, switching-off the burner when the temperature measured is higher than 85°C (185 F); the reset temperature is set at 80°C (176 F).
When sensor has tripped, the boiler will not function for either service.
Table 3 shows the resistance values ( ) that are obtained on the sensor as the temperature varies.

TABLE 3

Temperature		Resistance
°C	°F	(Ω)
20	68	12.090
30	86	8.313
40	104	5.828
50	122	4.161
60	140	3.021
70	158	2.229
80	176	1.669



KEY
1 Jumper JP2
2 Fuse (1,6 AT)
3 D.H.W. potentiometer
4 Connector "METHANE/GPL"
5 Rotay switch
7 Block red led
8 C.H. potentiometer
9 Bi-colour led gree/orange
10 Connector "TA"

Figure 15

3.3 ELECTRONIC IGNITION

Ignition and flame detection is controlled by an electrode located on the burner. These guarantee maximum safety with intervention times, for accidental switching off or gas failure, of within one second.

3.3.1 Operating cycle

Rotate the rotary switch to summer or winter, the red led should light up.
Burner ignition normally takes place within 10 seconds. However, it is possible for ignition failures to occur, with consequent activation of signal indicating that the control box has "locked out".

- **Gas failure**
  The control box runs through the cycle normally sending electric power to the ignition electrode. The electrode continues spark discharge for a maximum of 10 sec. If the burner does not ignite, the control box "locks out".
  This may occur upon first ignition or after long periods of boiler lay-off when there is air in the pipes. It may be caused by the gas cock being closed or by one of the valve coils having a break in the winding, so that the valve cannot open.

- **Ignition electrode fails to spark**
  In the boiler, only the gas to the burner is seen to open. After 10 sec. the control box "locks out".
  This may be due to a break in the wire of the electrode or to the wire not properly fastened to the electric terminal of the ignition transformer.
  The electrode is earthed or very worn and needs to be substituted. The control box is defective.

When there is a sudden voltage failure, the burner shuts out immediately, when power supply returns, the boiler will start up again automatically.

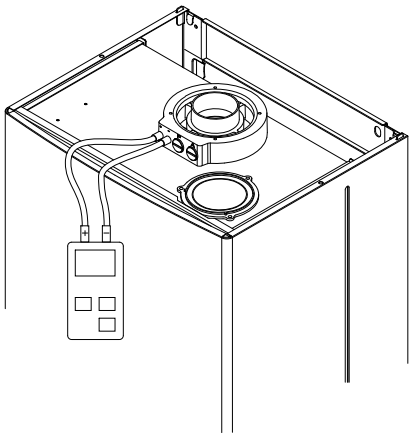


Figure 16

3.4 SMOKE PRESSURE SWITCH

(fig. 16)

The pressure switch with fixed settings: 4.6-5.6 mmH_2O (0.18-0.22 "W.C.H_2O), is able to guarantee the boiler operation even with air intake and smoke outlet pipes at the maximum limit of the length allowed.
The value of the signal to the pressure switch is measured by means of a manometer connected as shown in fig. 16.

3.5 FLOW SWITCH SAFETY VALVE

The flow switch (8 fig. 5) is tripped and stops the burner when it does not detect water flow in the primary circuit > 400 l/h (1.76 USgpm). To restore burner functioning, check system pressure and the functioning of the pump and the flow switch, and the cleaning of the "Aqua Guard Filter System" filter.
NOTE: If replacing the flow switch valve, make sure that the arrow stamped on the valve points in the same direction as the flow of water.

3.6 HEAD AVAILABLE TO SYSTEM

Residual head for the heating system is shown as a function of rate of flow in the graph in fig. 17.

RESIDUAL HEAD VERSUS FLOW FOR HEATING SYSTEM

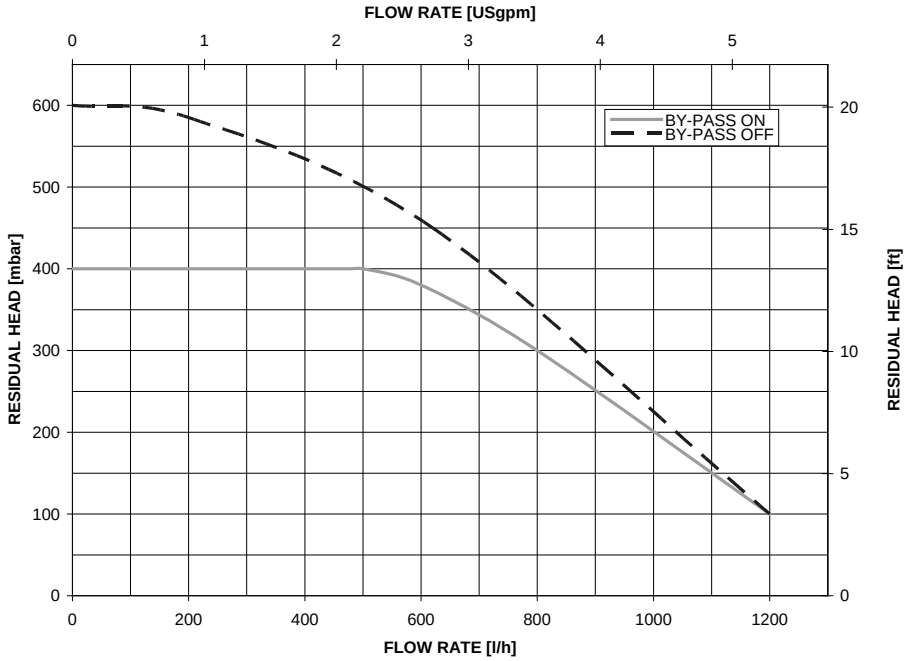


Figure 17

ENG

To obtain the maximum head available to the system, turn off the by-pass by turning the union to the vertical position (fig. 17/a).

3.7 ELECTRICAL WIRING OF ZONE HEATING SYSTEMS

When installing a system of this type, use a separate electrical line to which room thermostats with their local valves will be connected. Connect micro switches or relay contacts on terminals 15-16 of the **"TA"**connector of the electronic card after removing the existing jumper (fig. 18).

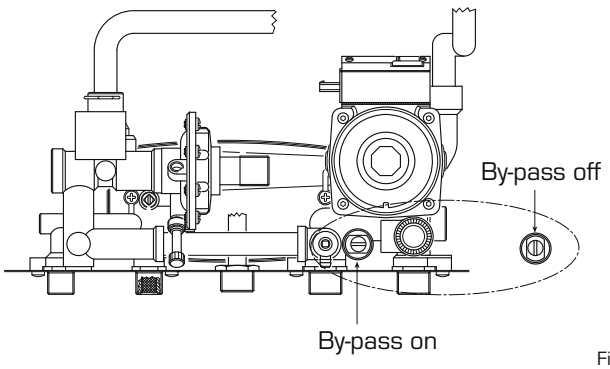
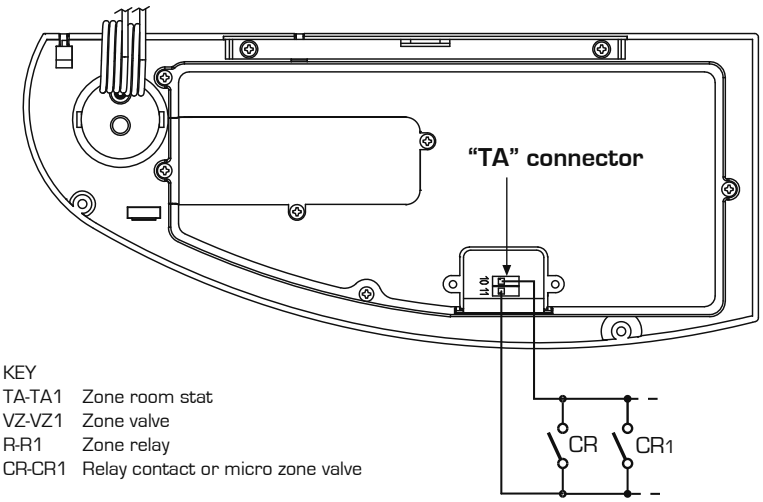
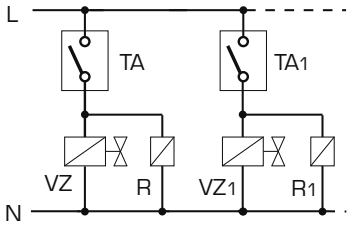


Figure 17/a



KEY
TA-TA1 Zone room stat
VZ-VZ1 Zone valve
R-R1 Zone relay
CR-CR1 Relay contact or micro zone valve



NOTE: Relays are used only if the area valves have no microswitches.

Figure 18

4 USE AND MAINTENANCE

4.1 D.H.W. TEMPERATURE ADJUSTMENT

The system with a potentiometer for adjusting the temperature of D.H.W. with a setting range from 30° to 60°C (86-140 °F) offers a double advantage:

1) The boiler adapts perfectly to any type of D.H.W. system, whether the mixing system is a mechanical or a thermostat-controlled type.
2) The thermal output is dosed according to the temperature required, which means a considerable saving in fuel.

NOTE: In order to avoid any misunderstanding please remember that the value obtained by the product of temperature difference (in °C) between D.H.W. output and input into the boiler by the hourly flow rate measured on the tap, where hot water is drawn off (l/h), cannot be higher than the useful output developed by the boiler.

For measurements and checks on flow rate and temperature of D.H.W., use suitable instruments, taking into consideration any heat dispersion along the stretch of piping between the boiler and the measuring point.

4.2 ADJUSTMENT OF D.H.W. FLOW RATE

To adjust the D.H.W. flow rate, use the flow rate adjuster (5 fig. 5).
Remember that the flow rates and corresponding temperatures of use of hot water have been obtained by positioning the selector of the circulation pump on the maximum value.
Should there be any reduction in the D.H.W. flow rate, the filter installed on the inlet to the divertor valve (3 fig. 5) will need cleaning.

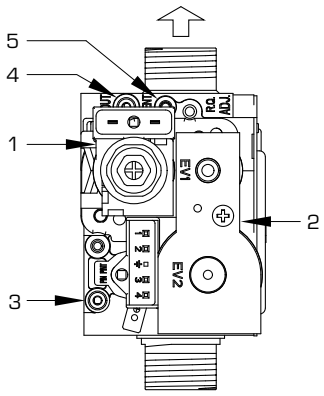
4.3 GAS VALVE

The boilers are equipped standard with the SIT 845 SIGMA/HONEYWELL VK 4105M / SIEMENS VGU 50 gas valve (fig. 21).
The gas valve is set at two pressure values: maximum and minimum. According to the type of gas burnt, these correspond to the values given in **Table 4**.
The gas pressures at the maximum and minimum values, are factory set. Consequently they must not be altered. Only when you switch the appliance from one type of gas supply (methane) to another (propane), it is permitted to alter the operating pressure.

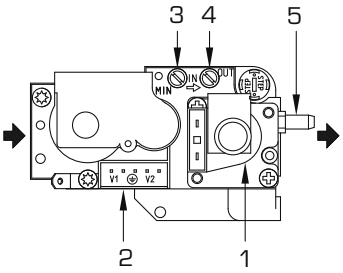
4.4 GAS CONVERSION

This operation must be performed by authorised personnel using original Sime components. In North America the only authorized personnel is Thermal Hydronic Supply Ltd. Please be advised that in order to convert from one gas to another the boiler must be shipped to Thermal Hydronic Supply. Otherwise, the boiler must be purchased already converted to the type of gas required.
The following are instructions to provide insight on the operation and function of the boiler controls. It is strongly advised that if you were not provided proper instructions from a factory representative or lack the proper tools or confidence on the function of such controls, that you do not attempt to perform the following procedures. Failure to correctly perform such tasks can cause the boiler to over-fire which can lead to severe personal injury, death or substantial property damage. To convert from natural gas to LPG or vice versa, perform the following operations (fig. 22):

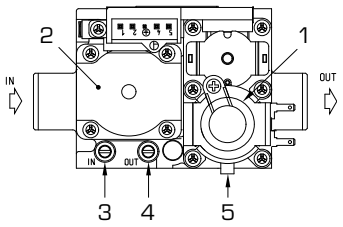
SIT 845 SIGMA



HONEYWELL VK 4105M



SIEMENS VGU 50



KEY
1 Modulator
2 EV1-EV2 coils
3 Pressure inlet upstream
4 Pressure inlet downstream
5 VENT pressure test point

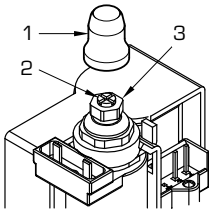
TABLE 4

	Burner maximum pressure		Modulator current
Fuel	mbar	W.C.	mA
Natural Gas*	13.7	5.5	130
Propane	24.9	10	165
	Burner minimum pressure		**Modulator current**
Fuel	mbar	W.C.	mA
Natural Gas*	5.0	2.0	0
Propane	8.7	3.5	0

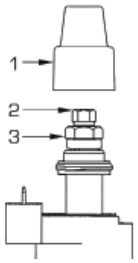
(*) Max. burner pressure is guaranteed only when the supply pressure exceeds the max. burner pressure by at least 3 mbar (1.2" W.C.).

Figure 21

SIT 845 SIGMA

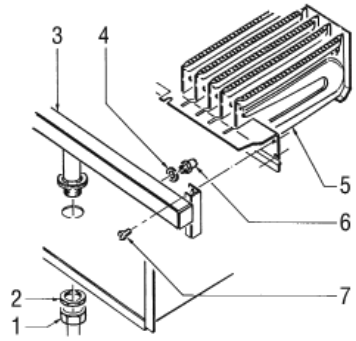


HONEYWELL VK 4105M
SIEMENS VGU 50



KEY
1 Plastic tap
2 Minimum pressure adjusting nut
3 Maximum pressure adjusting nut

Figure 22



KEY
1 Swivel connection 1/2"
2 Locknut 1/2"
3 Burner manifold
4 Washer ø 6.1
5 Burners
6 Nozzle M6
7 Screw

WARNING: To ensure a perfect seal, always use the washer (4) supplied in the kit when replacing nozzles, even in burner units for which it is not specified.

Figure 22/a

ENG

1. Close the gas cock.
2. Disassemble the burner manifold (3).
3. Replace the main nozzles (6) supplied in a kit, inserting the copper washer (4). Use a ø 7 wrench to perform this operation.
4. Remove the "METANO/GPL" connector link on the card and set it in the position corresponding to the gas to be used (4 fig. 15).
5. To set the values of maximum and minimum gas pressure, follow the instructions given in section 4.5.1.
6. After have ultimated the conversion of the boiler, please stick onto the casing panel the plate showing the relevant flue which is included conversion kit.

NOTE: When reassembling components which you have removed, replace gas seals; test all gas connections after assembly using soapy water or a product made specifically for the purpose, being sure not to use open flame.

4.4.1 Adjusting valve pressure

Set maximum and minimum pressure on gas valves as follows (fig. 22/a):

1. Connect the column or a manometer to the intake downstream of the gas valve. Disconnect the valve VENT pressure test point tube (5 fig. 21).
2. Remove the cap (1) from the modulator.
3. Place the hot tap water potentiometer knob at the maximum position.
4. Turn on the boiler using the four-way switch and turn on a hot water tap all the way.
5. Remember that rotating clockwise will increase pressure while rotating anticlockwise will diminish it.
6. Adjust maximum pressure using the nut (3 fig. 22/a) with a wrench to the maximum pressure value indicated in **Table 4**.
7. Do not adjust minimum pressure until you have adjusted maximum pressure.
8. Turn off the supply power to the modulator, and keep the hot water tap turned on.
9. Lock the nut (3) in place, turn the screw /nut (2) to the minimum pressure indicated in **Table 4**.
10. Turn off the boiler and turn it back on again several times, keeping the hot water tap turned on at all times and checking that the maximum and minimum pressure values correspond to the established values; correct the settings if necessary.
11. Adjust, checking that you have restored the power to the modulator.
12. Put the pipe back on the valve VENT pressure test point.
13. Remove the manometer, remembering to tighten the screw for closing the pressure test point.
14. Put the plastic cap (1) back on the modulator and seal with a drop of coloured sealant if necessary.

4.5 REMOVAL OF OUTER CASING

The casing may be removed completely to facilitate boiler maintenance, as shown in fig. 23.

4.6 CLEANING AND MAINTENANCE

Carry out the cleaning of the generator in the following way:

1. Unplug the power cord to the boiler and close the gas feed cock.
2. Remove the outer casing and the gas burner manifold unit . To clean the burner, blow in a jet of air, so as to remove any dust particles that may have accumulated.
3. Clean the heat exchanger, removing any dust or residue from combustion. When

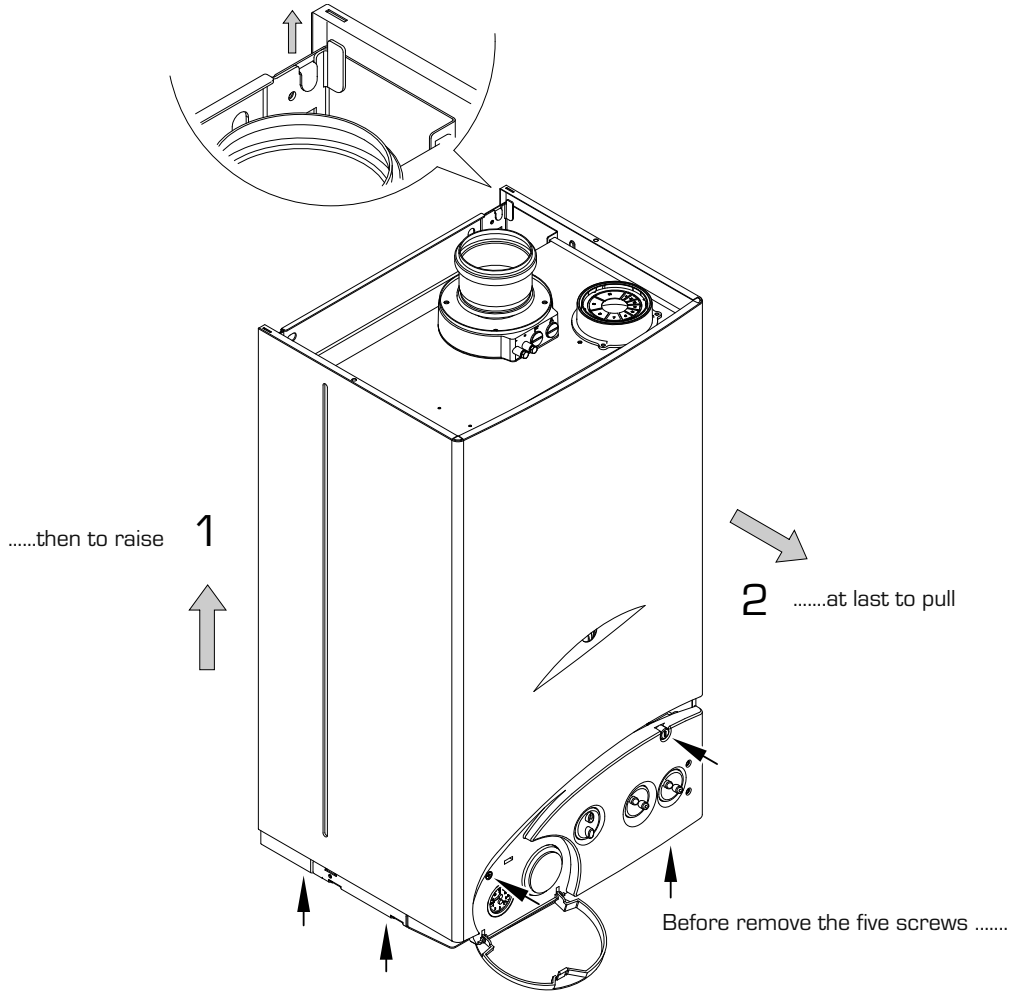


Figure 23

cleaning the heat exchanger or the burners, chemical products or steel brushes MUST NOT BE USED.
Make sure that the tops of the burners with the holes are free from encrustations.

4. Reassemble the items removed from the boiler, making sure to follow the correct sequence.
5. Check operation of the main burner.
6. After assembly of all the gas connections, these must be tested for soundness, using soapy water or appropriate products. DO NOT USE NAKED FLAMES.
7. Do not use calcium chloride to treat the plastic component during general maintenance.

4.6.1 Chimney sweep function (fig. 24)

To carry out the verification of combustion in the boiler turn the selector and stop on the position ( ) until the green/orange led starts to flash intermittently.
From that moment the boiler will start functioning in heating mode at the maximum power, with switching off at 80°C (176° F) and restarting at 70°C (158° F).
Before activating the chimney sweep function make sure that the radiator valves or eventual zone valves are open. The test may be carried out also during hot-water service functioning. To do so it is enough, after having activated the chimney sweep function, to take some hot water from one or more taps.
Even in this condition the boiler functions at the maximum temperature always with the primary controlled between 80°C (176° F) and 70°C (158° F).
During the entire duration of the testing the hot water taps must remain open. After verifying the combustion the boiler should be switched off by placing the selector on the **OFF** position; then return the selector to the desired function.

ATTENTION: After about 15 minutes, or once the hot water request has been fulfilled, the chimney sweep function automatically deactivates.

4.6.2 Cleaning the filter "Aqua Guard Filter System" (fig. 24/a)

To clean the filter, close the delivery/return on/off taps, turn off the power to the control panel, remove the casing and empty the boiler using the drain provided.
Place a container for collection underneath the filter, unscrew the cap and proceed to clean the filter, removing impurities and limestone deposits.
Check the seal o-ring before reassembling the cap with the filter.

4.6.3 Venting maintenance

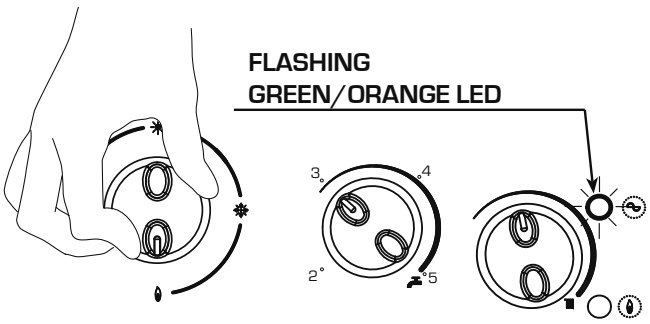


Figure 24

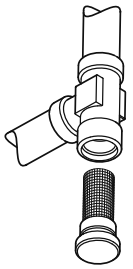


Figure 24/a

The venting system shall be visually inspected for deterioration or deposits every 6 months it is recommended to periodically inspected the intake and the exhaust terminal for debris or snow removed from blocking the termination. Any dirt within the vent shall be removed with a soft brush.

4.6.5 Fan and pump

The pump and fan don't need any lubrification.

4.7 FAULT FINDING

The burner does not ignite and the circulator is working.

1. Check that the water pressure reads 1 - 1.2 bar (14.5-17.4 psi).
2. The flowmeter is faulty, replace it.
3. The flow switch has been tripped because the heating circuit filter "Aqua Guard Filter System" is obstructed with impurities; it needs cleaning.

Main burner does not start either to draw off D.H.W. or for heating.

1. Check flowmeter; if necessary, replace it.
2. Check whether electric power is reaching the gas valve actuator; check its operation and, if necessary, replace it.
3. Check operation of the smoke pressure switch.
4. The fan is operating but at low rpm, so failing to activate the smoke pressure switch; replace the fan.
5. Replace the electronic card.

Boiler turns on, but after 10 seconds "locks out".

1. Check that during electric wiring the position of line and neutral have not been inverted.
2. The ignition/sensing electrode is faulty; replace it.
3. The control box is faulty; replace it.

Gas valve fails to modulate in D.H.W. and C.H. modes.

1. The sensor is interrupted; replace it.
2. The modulator has a break in winding; replace it.
3. Check that the current to the modulator complies with the specifications.
4. The control box is faulty; replace it.

Boiler is noisy or heat exchanger makes a sizzling sound.

1. Check whether circulation pump P is obstructed; if necessary clear it out.
2. Unclog impeller of circulation pump, clearing away any impurities or sediments.
3. Circulation pump is burnt out or has a lower rpm than required; replace it.
4. Check boiler output is adequate for actual needs of heating system.

Boiler safety valve keeps tripping.

1. Flush the safety relief valve to remove any sediment or debrit and ensure a proper valve seal. If it doesn't close properly, replace it.
2. Check system cold charge pressure is not too high;
   keep to recommended values.
3. Check whether safety valve is out of calibration; if necessary, replace it.
4. Check whether the vessel is sufficiently capacious to contain the water for the system.
5. Check preloading pressure of expansion vessel.
6. Replace expansion vessel if faulty.

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Radiators fail to heat up in winter.

1. The rotary switch is on "Summer"; switch to "Winter".
2. The room stat is set too low or needs replacing because faulty.
3. The electrical connections of the room stat are wrong.

Main burner burns badly: flames too high, deep yellow.

1. Check that pressure of burner gas is regular.
2. Check burners are clean.
3. Check coaxial assembly has been installed correctly.

Smell of unburnt gases.

1. Check boiler is properly clean.
2. Check draught is sufficient.
3. Check gas consumption is not too high.

Boiler operates but does not increase temp.

1. Check gas consumption is not lower than it should be.
2. Check boiler is clean.
3. Check boiler is sized in proportion to system.

Upon demand for D.H.W. or heating, fan fails to turn at max speed.

1. Make sure that the smoke pressure switch is working and that the relative contact is in the rest position.
2. Check whether connection tubes of smoke pressure switch are obstructed and, if necessary, clean away impurities or condensate.
3. The smoke pressure switch needs replacing.
4. Replace electronic board.

The boiler and the green voltage LED switch off.

1. This indicates that the automatically resettable PTC thermal protection on the electronic board has tripped.
   To resume operation, disconnect the unit from the mains for at least one minute by pressing the main switch on the outside of the boiler.

4.8 LOCATION MAIN SHUTOFF VALVE

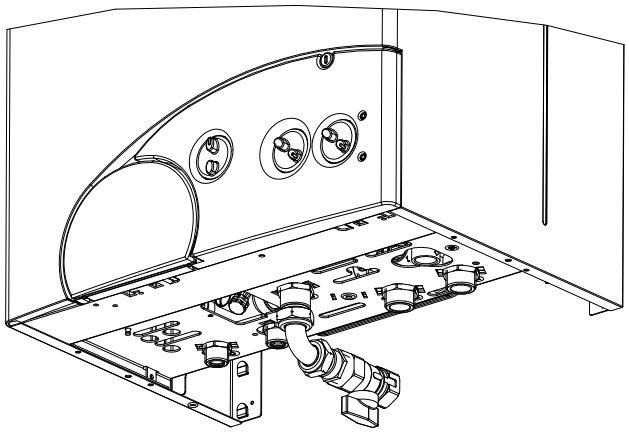


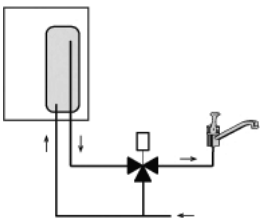
Fig. 25

Caution: label all wires prior to disconnection when servicing controls.
Wiring errors can cause improper and dangerous operation.

Verify proper operation after servicing.

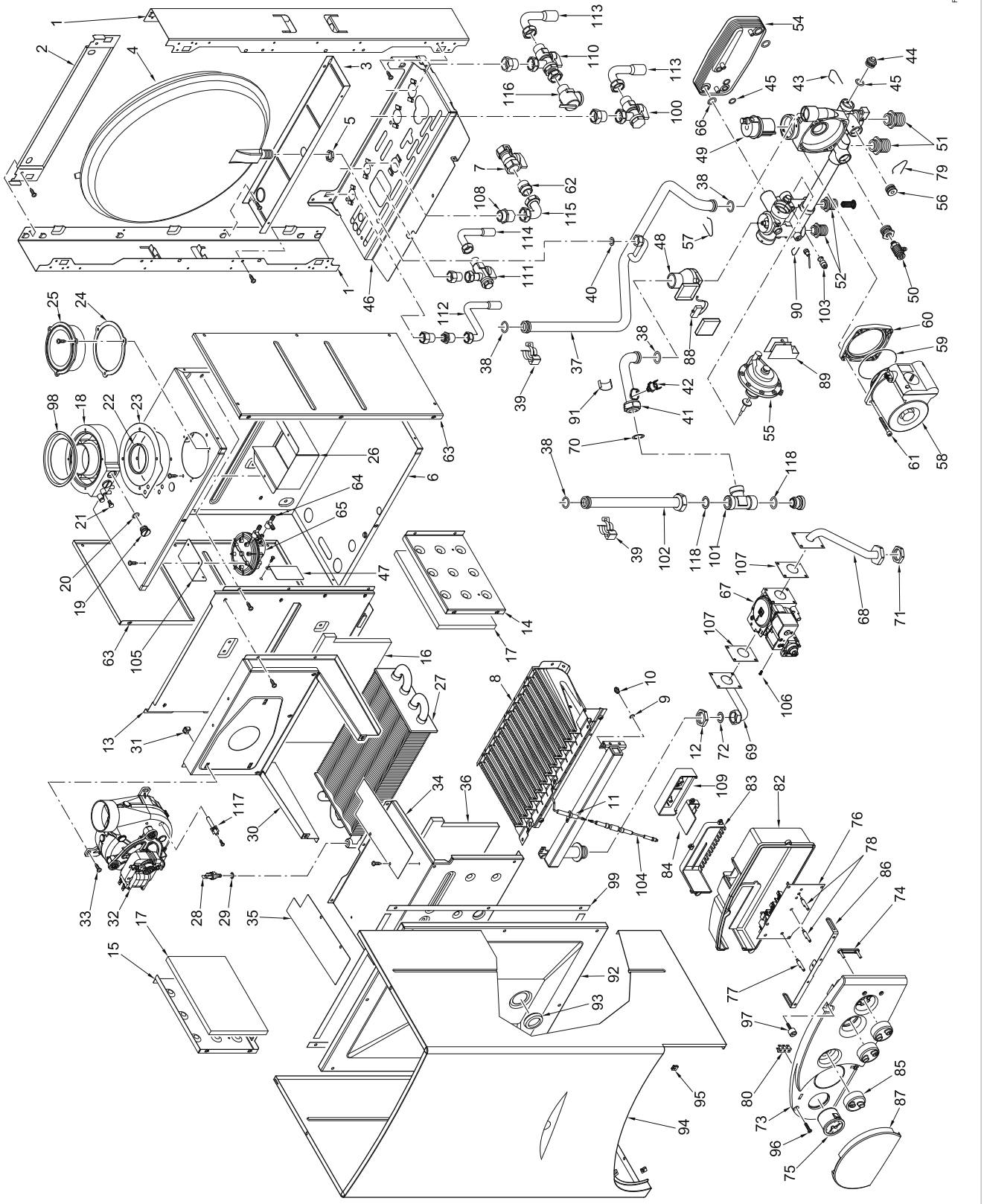
Parts previously used for heating must not be reused in the fabrication of the drinking water system.

To avoid possible damage caused by hot water, we recommend that a mixer valve is installed according to the attached layout.



5 EXPLODED VIEWS / VUES ÉCLATÉES

ENG



POSITION		CODE	DESCRIPTION	MODEL	NOTE
1		6138570	Elément droite/gâuche châssis Side frame part		
2		6138771	Elément superieur châssis Frame assembly upper support		
3		6255431	Support inférieur vase d'expansion Expansion vessel lower support		
4	•	5139130	Vase d'expansion l.8 - 3/8" M Expansion vessel l.8 - 3/8" M		
5		6146305	Contre-écrou 3/8" en laiton Brass Nut 3/8"		
6		6288111	Paroi postérieur chambre étanche Sealed chamber rear panel		
7		6177540	Robinet gaz 3/4" Gas cock 3/4"		
8		5190760	Ensemble brûleur pour gaz naturel Main burner assembly		
9		6022004	Rondelle cuivre Ø 6 Copper washer Ø 6		
10		6154402	Injecteur Ø 130 M6 gaz naturel Main burner nozzle NP 130 natural gas		
11	•	6235931	Electrode allumage-ionisation Ignition-ionisation electrode		
12		6146301	Contre-écrou 1/2" en laiton Brass nut 1/2"		
13		6288417	Paroi postérieur chambre combustion Combustion chamber rear panel		
14		6288511	Panneau côté droit chambre combustion Combust. chamber right hand side panel		
15		6288611	Panneau côté gauche chambre combustion Combust. chamber left hand side panel		
16		6139773	Isolation arrière chambre de comb. Combustion chamber rear insulation		
17		6139792	Calorifuge latéral chambre combustion Combustion chamber side insulation		
18		6287900	Collecteur air-fumées Air/smoke manifold		
19		6147406	Bouchon collecteur air-fumées M14x1,5 Air/smoke manifold plug M14x1.5		

POSITION		CODE	DESCRIPTION	MODEL	NOTE
20		6226417	Joint OR 3043 Ø 10,77x2,62 O-ring 3043		
21		6242602	Vis collecteur air-fumées Air/smoke manifold screw		
22		6248803	Joint OR pour tuyau Ø 60 Lip seal for Ø 60 pipe		
23		6028706	Joint collecteur air-fumées Air/smoke manifold gasket		
24		6028707	Joint prise de l'air conduits séparés Air intake gasket		
25		6288000	Prise de l'air conduits séparés Air intake		
26		6257512	Déflecteur conduits séparés Air deflector for separate ducts		
27	•	6174246	Echangeur gaz/eau Heat exchanger		
28	•	6231351	Sonde plongée Plunged sensor		
29	•	6022010	Joint sonde Sensor gasket		
30		5190610	Ensemble chambre à fumées Smoke chamber assembly		
31		2016020	Ecrou M4 Locked nut M4		
32		6225633	Ventilateur Fan		
33		2000715	Vis TCB M4x10 Screw TCB M4x10 AISI 304		
34		6288710	Panneau avant pour chambre combustion Combustion chamber front panel		
35		6257511	Déflecteur de l'air Air deflector		
36		6139771	Calorifuge avant pour chambre comb. Combustion chamber front insulation		
37		6264826	Tuyau retour chauffage C.H. return pipe		
38	•	6226412	Joint OR Dalmar AN13 (3068) O-ring 3068		

• Recommended stock parts - Componenti da tenere a scorta

POSITION		CODE	DESCRIPTION	MODEL	NOTE
39	•	6226601	Ressort de liaison échangeur Spring for heat exchanger connection		
40		2030226	Joint Ø 10,2x14,8x2 Gasket Ø 10,2x14,8x2		
41		6264748	Tuyau départ installation C.H. flow pipe		
42	•	6146701	Aquastat de sécurité 100°C 100°C safety stat		
43		6226612	Ressort de fixation tuyaux double Pipe fixing double spring		
44	•	6119370	Bouchon pour groupe en Technyl Plastic plug		
45		6226414	Joint OR 117 Ø 13,1x2,62 EP851 O-ring 117 Ø 13,1x2,62 EP851		
46		6138880	Elément inferieur châssis Frame assembly lower side		
47		6215220	Plaque de protection cables Cables protection bracket		
48	•	6281502	Piecès detacheés fluxostat Flow water switch spare parts		
49	•	6013101	Purgeur d'air automatique Automatic air vent		
50	•	6017210	Purgeur manuel 1/4" Manual air vent 1/4"		
51		6281500	Raccord 3/4" Straight fitting 3/4"		
52		6281501	Raccord 1/2" Straight fitting 1/2"		
54	•	6281525	Kit echangeur à 16 plaques 16 plate heat exchanger kit		
55	•	6281504	Vanne de déviat. à pression d'eau Divertor valve		
56		6119355	Bouchon pour groupe en Technyl Brass plug for hydraulic group		
57		6226607	Ressort de fixation tuyaux Pipe fixing spring		
58		5192603	Kit pompe VA65 Dab Dab VA65 pump kit		

POSITION		CODE	DESCRIPTION	MODEL	NOTE
59		6028705	Joint EP709 pour Dab Gasket EP709 for Dab		
60		6281521	Bride + OR pour moteur Dab Flange + OR for Dab pump		
61		2000201	Vis M5x40 Screw M5x40		
62		6120525	Nipple 3/4" x 3/4" OT Nipple 3/4"x3/4" OT		
63		6288200	Paroi latér. droite/gauche ch. étanche Sealed chamber side panel		
64		6280500	Raccord à trois voies av. prise press. 3-ways junct. with press. test nipple		
65	•	6225724	Pressostat Huba type 605.99.433 Air pressure switch		
66	•	6226421	Joint OR Dalmar R12 O-ring Dalmar R12		
67		6243830	Vanne gaz type SIT 845 SIGMA SIT gas valve type 845 SIGMA		
68		6226874	Tuyau entrée gaz Gas inlet pipe		
69		6226953	Tuyau raccordement vanne gaz-brûleur Pipe connecting gas valve-main burner		
70		2030228	Joint Ø 17x24x2 Gasket Ø 17x24x2		
71		6146302	Contre-écrou 3/4" en laiton Brass nut 3/4"		
72		2030227	Joint Ø 12x18x2 Gasket Ø 12x18x2		
73		6289821	Tableau de bord Control panel		
74		6273210	Guide lumiére - 2 sorties Guidelight - 2 ways out		
75	•	6217005	Thermomanomètre Temperature and pressure gauge		
76		6230631	Plaque éléctronique avec allumage Main PCB with ignition		
77		6201502	Arbre pour trimmer Ø 6 Trimmer spindle Ø 6		

• Recommended stock parts - Componenti da tenere a scorta

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ENG

POSITION		CODE	DESCRIPTION	MODEL	NOTE
78		6201505	Arbre pour trimmer Ø 6 Trimmer spindle Ø 6		
79	•	6226602	Ressort de fixation tuyaux Pipe fixing spring		
80		2211610	Bornier à 6 fast-on Earth faston		
81		6226429	Joint OR Dalmar 121 O-ring 121		
82		6289901	Protéction tableau de bord Control panel protecting cover		
83		6290301	Couvercle cables panneau de bord Control panel cable cover		
84		6290201	Couvercle raccord. therm. d'ambiance Room stat connection cover		
85		6290102	Poignée blanche Ø 40 White knob Ø 40		
86		6009585	Plaque de support tableau de bord Control panel bracket		
87		6290019	Guichet Flap door		
88	•	6131401	Micro pour fluxostat Microswitch for flowmeter		
89		5191900	Micro vanne de déviation + support Divertor valve microswitch + support		
90		6226605	Ressort de fixation Fixing spring		
91		2051100	Ressort de fixation capillaires Retaining spring		
92		6288310	Porte antérieur chambre étanche Sealed chamber front panel		
93		6001210	Regard de flamme Peephole		
94		6287331	Jaquette Casing		
95		2013302	Plaquette pour vis à tôle Fastener for self tapping screw		
96		2004510	Vis 8Px7/8" Screw 8Px7/8"		

POSITION		CODE	DESCRIPTION	MODEL	NOTE
97		6112420	Vis tableau de bord Control panel screw		
98		6028623	Diaphragme air Ø 86 Air diaphragm Ø 86		
99		5192200	Kit joint chambre étanche Gasket for sealed chamber		
100		6177544	Robinet gaz 3/4" Gas cock 3/4"		
101	•	6295501	Filtre chauffage 3/4"M x 3/4"M C.H. filter 3/4"M x 3/4"M		
102		6264746	Tuyau connexion filtre-echangeur Pipe conn. C.H. filter-C.H. exchanger		
103		6281512	Régulateur du débit Water rate adjuster		
104	•	6269810	Cable pour allumage Ignition cable		
105		6229101	Support pressostat Smoke pressure switch bracket		
106		6238602	Bouchon pour sortie pilostat SIT SIT pilot plug 0.972.041		
107	•	6162401	Joint pour vanne gaz Square gasket		
108		6120511	Nipple 3/4" x 3/4" OT Nipple 3/4"x3/4" OT		
109		6290351	Couvercle bornier Terminal strip protection cover		
110		6177542	Robinet gaz 3/4" Gas cock 3/4"		
111		6177543	Robinet installation C.H. illet fitting		
112		6142450	Courbe 1/2" x 15 Bend 1/2" Ø 15 connect. boiler to jig		
113		6142451	Courbe 3/4" x 18 Bend 3/4" Ø 18 connect. boiler		
114		6142452	Courbe 1/2" x 15 Bend 1/2" Ø 15 connect. boiler		
115		6142453	Courbe 3/4" x 18 Bend 3/4" Ø 18 connect. boiler		

• Recommended stock parts - Componenti da tenere a scorta

POSITION	CODE	DESCRIPTION	MODEL	NOTE
116	6040220	Soupape de sécurité Watts30PSI Pressure relief valve Watts30 PSI		
117	6263913	Prise de pression pour ventilateur Fan pressure test point		
118	2030252	Joint Ø 16x24,5x2 Gasket Ø 16x24,5x2		
	5187325	Groupe hydraulique en Technyl Technyl hydraulic group		
	5191190	Tableau de bord complet Complete control panel		
	6201901	Cable avec épine Cable with plug		
	6245368	Connecteur 90° Connector 90°		
	6299994	Connecteur à 4 bornes Lumberg 4 pole Lumberg cable connector		
	6299995	Connecteur à 14 bornes Lumberg 14 pole Lumberg cable connect		
	6299996	Connecteur à 6 bornes Stocko 6 pole Stocko cable connect		
	5185403	Set de transf.à gaz nat. 25-30-35 kW Convers. kit to nat. gas 25-30-35 kW		
•	6233506	Fusible Ø 5x20 T1,6A 250V Fuse T1,6A 250V		
•	6281506	Kit joint OR pour groupe hydraulique O-ring kit for hydraulic group		
	6281507	Kit goupille OR pour groupe hydraul. Split pin kit for hydraulic group		
	6281523	Collecteur chauffage en Technyl C.H. Technyl manifold		
	6281524	Collecteur sanitaire en Technyl D.H.W. Technyl manifold		
	5144720	Set de transf. à GPL Conversion kit to LPG		

POSITION	CODE	DESCRIPTION	MODEL	NOTE

Produits de réference / Products reference

8104691: Format.zip 35 BF CDN

Vérifier la correspondance avec la plaque signaletique.
Check the correspondence with the boiler data plate.

• Recommended stock parts - Componenti da tenere a scorta

EMBASSY INDUSTRIES Inc.

315 Oser Avenue • Hauppauge, NY 11788
Tel: (631) 694-1800 • Fax: (631) 694-1832
www.embassyind.com

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